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ABSTRACT

This report contains the results of a pilot test which represents the first complete field test of methodological work begun in October 1967 under a Federal grant for the purpose of job analysis in the health services. This 4-year Health Services Mobility Study permitted basic research, field testing, practical application, and policy involvement to be applied to 12 job titles in ambulatory patient care in a community health center. Persons interested in upward mobility, relieving manpower shortages, health manpower development, health education, or delivery of health services will find useful these extensive suggestions for career ladders with curriculum content necessary for sequential job development. Task descriptions are presented, in addition to job lattices, task sequences, and curriculum designs. Numerous tables, charts, and other resource materials present the data. (AG)

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MOBILITY
STUDY

Research Foundation, City University of New York

SUGGESTIONS FOR JOB AND CURRICULUM LADDERS IN HEALTH CENTER AMBULATORY CARE

A Pilot Test Of The Health Services Mobility Study Methodology

Research Reports Nos. 4 and 5

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SUGGESTIONS FOR JOB AND CURRICULUM LADDERS IN HEALTH CENTER AMBULATORY CARE

A PILOT TEST OF THE HEALTH SERVICES MOBILITY STUDY METHODOLOGY

by
Eleanor Gilpatrick

Research Reports Nos. 4 and 5

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CAUTIONARY NOTE

The reader should be aware of the fact that this document reports on the results of a pilot test of the Health Services Mobility Study's job analysis methodology. The task data collected were not subjected to normative evaluation and do not necessarily represent ideal performance levels. The results are therefore subject to review and revision before they are implemented.

Please note that this document reports on the HSMS methodology and a vast amount of field data. However, the document is not a method manual, nor are all the field data reproduced here.

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Our very special thanks go to Dr. Regina McCormack who, while on leave from the University of Virginia, became interested in our work and its relevance to the needs of the Dr. Martin Luther King, Jr., OEO Health Center. Because of Dr. McCormack's interest and faith we were invited to conduct our pilot test at the Center. Dr. William Lloyd, the Center's Project Director, and the staff at the Dr. Martin Luther King, Jr. Health Center gave us unstinting cooperation and encouragement in spite of very heavy work pressures. We hope that our results are sufficiently utilizable to have made their efforts worthwhile.

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PREFACE

The Health Services Mobility Study (HSMS) has had the unique privilege of being funded to develop a methodology for job analysis over a period of four years. This has permitted basic research, scientific field testing, practical application and policy involvement. The Study is sponsored by the City University of New York (CUNY) through its Research Foundation and the Hunter College Institute of Health Sciences. The Study's Director, Dr. Eleanor Gilpatrick, holds the rank of Associate Professor at the Hunter College Institute of Health Sciences.

This Report contains the results of a pilot test which represents the first complete field test of methodological work begun in October, 1967, under a grant from the Office of Economic Opportunity. The Study was subsequently funded jointly by the Manpower Administration of the Department of Labor, the Health Services and Mental Health Administration of the Department of Health, Education and Welfare, and the Office of Economic Opportunity.

The reader will note that the Report is listed as Research Reports Numbers 4 and 5. The original plan was to have separate reports on the job ladders and on the related curriculum ladders. However, once the analytical work was near completion, it became apparent that the two parts are too intimately intertwined to be presented as two separate documents. Since Research Reports Numbers 4 and 5 constitute the "Final Report" contracted for with the Health Services and Mental Health Administration, the designation has been retained in the title.

CHAPTER 1

INTRODUCTION

This is a report on the first pilot test of the Health Services Mobility Study's (HSMS) method of job analysis. After several years of preparation, development, testing and revision, the method has been applied to twelve titles in ambulatory patient care in a Community Health Center.

There are two sets of results. The first set indicates that the methodology can be applied and that it "works." The second set of results are based on the specific content of the test data. We are able to report on the task content of several possible job ladders and to recommend the curriculum content of the education needed for the sequences.

This report will be of interest to several types of audiences. First, as a report on the methodology, it will be of interest to anyone concerned with providing upward mobility and/or relieving upper level shortages. Second, for those concerned with providing upward mobility within patient care, the actual content of the pilot test titles and tasks and the recommended ladders have generalizable relevance. Third, for those concerned with providing the education for health care occupations, the skill and knowledge content of the results will also provide informative and suggestive insights. Finally, anyone interested in health care service delivery or in health manpower should find something of interest in the Report.

ORGANIZATION OF THE REPORT

This document reports on an enormous amount of data. To provide the most readable and interesting format, much of the raw data, which would require several volumes, are not presented. The reader will be able to obtain raw data to meet his needs by contacting the Health Services Mobility Study. The Appendix tables provide most of the background data needed for the reader who wishes fuller elaboration of the statements in the text.

Chapter 1 tells the reader about the approach of the Health Services Mobility Study and sets the methodology within a framework of current manpower problems in the health services industry. It also provides a summary of the pilot test results.

Chapter 2 describes the HSMS methodology as it was applied, and presents a description of the pilot test and the titles it covered. Chapter 3 discusses the general results of the pilot test and their implications. Chapter 4 goes into greater detail and presents the actual task sequences identified by the method and the related curriculum content requirements. Chapter 5 talks about practical application of the results in job restructuring and curriculum, assuming no desire for major reorganization. Chapter 6 discusses more idealized applications of the results and presents job ladders that require job restructuring and redesigned curricula, assuming a willingness on the part of the institutions to undertake major reorganization. Chapter 7 makes some final comments on general policy and describes the spin-off applications of the method in performance evaluation and curriculum design.

BACKGROUND

It can be said about the American economy that more and more jobs within it require specific training, and that proportionately more items purchased in the market place are services rather than goods. The health industry, which produces health services, is the most dramatic embodiment of such market shifts. Not only has the rate of technological change in health care been rapid, but the demand for health care has risen in major proportions, while the supply of health care manpower has been critically short and more and more in need of specific training.

In a classical labor market the changing conditions of demand would have resulted in a shift of manpower to fill the changing manpower needs of the industry. But this has not occurred because the market in health manpower has not been a classic one. To begin with, it is only recently that health services have been viewed as the products of an industry which must allocate scarce resources efficiently or pay the economic consequences. Second, while health care delivery institutions have tended to develop internal training for the manpower needed to utilize the new technologies, the new functions have been immediately hedged with credential barriers such as licensure or certification, and professional associations have sprung up to guard the new titles, regardless of the relationship of the new functions to existing functions. As a result, there is a proliferation of credentialed health care occupations which overlap and duplicate functions. Because they are credentialed, these titles generally require formal, accredited training. The training in each case assumes no prior experience or training in health care, and, therefore, there is the probability of enormous overlap across educational programs.

The proliferation of credential barriers has not stopped institutions from adapting actual job functions to internal needs. The results of both is the fact that almost all health occupations are dead ends. Not only is the aide locked into a title; the nurse, the cook, and the internist are also at dead ends. For the individual to be mobile in this industry the burden falls on him or her to obtain the required, often redundant training needed for entry into a new, credentialed title. The irony is that, once the individual has obtained the credentials, there is no guarantee that the required credentialed training will be relevant or fully utilized in the new institution or job.

The health industry has another type of bind, in that it has been stultified by the sex images attached to the credentialed titles. It may be because women were conceived of as temporary members of the labor force that the Nurse Aide, Licensed Practical Nurse and Registered Nurse functions have been allowed to remain segmented, go-nowhere occupations. (In point of fact such workers show long years of devoted service.) In any case, more attention was paid to the conditions facing these occupations only after it was determined that there were critical shortages in nursing, that the occupations could be carried out by men, and that men eschewed the feminine sound of the titles. In all likelihood, men also eschew the dead-end nature of the jobs. In the drive towards overcoming inner-city and hard core unemployment, and in the politically motivated concern for the unemployed male head of house and returning veteran, terms such as "medic" and "physician's assistant" became popular. As in all other cases, the tendency is to segment, with no attention to existing occupations or the relationship to existing functions. This time the new titles have male images, and the nurse is again locked in.

In an industry in which the physician and hospital administrator is assumed to be male, and the nurse and dietary worker is assumed to be female, there has been a tendency to develop administrative enclaves in nursing and food service which run as separate entities. Many trained professionals have had to rise to administrative levels if they were to rise at all, thus giving up the very functions that attracted them to health care in the first place.

The greatest social cost in the health industry lies in the education and training of its manpower. There are shortages of schools and shortages of properly trained skilled and professional personnel. The greatest waste in the health industry lies in the allocation of functions to personnel and in the redundancy of training requirements. It is an irony of the industry that its employment structure is shaped like a pyramid, with large numbers of semi-skilled employees at the aide level available without serious shortages, while the shortage structure is shaped like a pyramid resting on its apex, with the largest numbers of shortages near the top. This would be an ideal industry for the development of upward mobility programs utilizing its existing labor force. Yet, institutional barriers have, up to the present, inhibited the implementation of such solutions.

The Health Services Mobility Study set itself the job of creating a basic methodology which would make possible the elimination of shortages through the utilization of existing manpower. It sought to minimize educational resources through the utilization of prior knowledge and experience, and thus make possible upward mobility for individuals by utilizing the skill and knowledge links between tasks and jobs. In other words, by focusing on what is learnable and transferable in the content of tasks, the investments in education could be utilized in the creation of job progressions.

The Study set itself this assignment knowing that certain key pitfalls had to be avoided. The first was that the quality of professional level service could not be distorted. The judgmental and theoretical aspects of professional service had to be respected, acknowledged and accounted for. Second, the skilled aspects of being sensitive to peoples' needs, of being responsive to the charge of caring for people's lives, health and well being, of being able to make decisions, see implications and draw conclusions, all had to be respected, acknowledged and accounted for. Third, the difference between the rote performance of clinical procedures and the comprehending application of information and concepts had to be accounted for. The difference between these distinguishes transferable knowledge from non-transferable, procedural information. Finally, we knew that we would have to look at work as it is currently being performed before we could go on to talk about sequences and job ladders that would actually draw on prior training. We knew we would have to look at tasks as they are performed, regardless of the titles in which they are found, and let the data results lead us to our conclusions about levels, sequences and ladders.

The HSMS system of job analysis has four components. The first is task identification; the second is identification and rating of each task on 16 skill scales; the third is the identification and rating of the knowledge needed for each task within an organized system of knowledge classification. The fourth component is the statistical manipulation of the task data so as to identify the interrelated skills and knowledge categories and then to identify task sequences based on the families of interrelated skills and knowledges. From these results job ladders are designed.

SUMMARY OF RESULTS

1. The Health Services Mobility Study has been able to achieve a task definition which is applicable to tasks at the physician level (or any other professional level) as well as tasks at the lowest levels. It accounts for the contingencies and emergencies which can periodically arise in tasks and thus does not water down professional performance by over-fragmentation of tasks.
2. The HSMS has been able to develop and apply 16 skill scales which are usable in the field, are fairly reliable and can be applied to all tasks, regardless of content.
3. The HSMS has been able to develop a System for the classification of knowledge which can be used in varying settings. The scale devised for use with the System makes it possible to rate each task for the level of knowledge in a subject that has been identified as being required for task performance.
4. The computer-based statistical procedures "work." That is, the advanced form of factor analysis used results in group-

ings (factors) of skills and knowledges which are interpretable, make sense, and satisfy statistical criteria for "good" factor results. Moreover, the counter-rotation of these skill and knowledge factors results in factors of tasks which permit the arrangement of tasks into hierarchies which reflect the relationship of task requirements to the groupings of skills and knowledges. It was thus possible, with some further analysis, to arrange these hierarchies into sequences or levels, so that actual stages and ladders could be devised.

5. The data results are of such a nature that lattices as well as ladders were designed. For each, the data indicate the skill and knowledge content necessary for a given rung. Thus, the data also make it possible to identify the additional training needed to go from one rung on a ladder to another which is laterally, vertically or diagonally related to it.

6. There is preliminary evidence to warrant the restructuring of several of the jobs studied on purely practical lines to provide for better allocations of tasks to jobs.

7. There is preliminary evidence to warrant the granting of advanced standing in credentialed academic programs for current incumbants in non-credentialed or lower-level titles, even without alteration of current job structures.

8. The distinction between professional and lower-level tasks appears to have two aspects. First, in health occupations, the sheer quantity of knowledge categories increases at upper levels; second, there is a sharp rise in the level of comprehension required at upper levels even where the knowledge categories have already been covered. The task sequences suggest, however, that jobs can be structured to provide for graduated increments in the number of subject areas and in the levels of the subject areas required.

9. Six sets of task sequences have been identified from the task data covered in the pilot test titles in ambulatory patient care. Two begin at the professional level and can only be reached by a lattice-like movement from the other four. These two deal with surgery and with diagnosis and prescription of care within the fields of internal medicine, obstetrics-gynecology and pediatrics. The other four cover female care, physical treatment, social service and counseling (behavioral functions), and machine related care and radiology.

10. The task sequences suggest that traditional distinctions in specialties may not be as relevant for ladders as functional specialties. Where skills are involved, the sequence of tasks ensuring continued clinical practice may be more important than the assignment of tasks according to traditional specialties.

11. Four ladders have been designed based on the task sequences which can be followed at the Center studied provided that changes in job structure, formal curricula and licensure can be achieved. These cover Medical, Psychological and Social Health Maintenance; Physical Care and Treatment; Female Care; and Machine Related Care and Radiology.

12. The pilot test data suggest that the task sequences are somewhat truncated when applied to a narrow group of twelve titles; the results should be richer, more generalizable and more viable when the data base is widened to other types of institutions and to other titles.

CHAPTER 2

THE PILOT TEST AND THE METHODOLOGY

By March of 1971, much of the HSMS methodology in job analysis had been devised and most aspects had been field tested in discrete parts. The time had come to test the method as a system. The need was to apply the method in an institution where the results would be of interest, and to cover a large enough number of titles so as to provide meaningful results.

THE PILOT TEST

At that time HSMS was invited to test the methodology at the Dr. Martin Luther King, Jr. Health Center, which is an entity of Montefiore Hospital in the Bronx. The Center is an OEO, ambulatory care, community health center that has pioneered in the provision of family-oriented medical care.

The needs of the Center involved its senior staff in a concern with the development of primary care practitioners in the setting of a Family Health Team. The goals of upward mobility are shared by most OEO Centers, but other goals such as the delivery of special services to fill community needs, the development of jobs for neighborhood residents, in-service training programs, and attractive salary levels for entry-level employees have often been given greater priority when there seemed to be a conflict of objectives.

It was agreed that task analysis could provide information about the functioning of the Family Health Team, leading to the development of a primary care practitioner. Though this was the chief concern of the Center, the HSMS goal of identifying possibilities for upward mobility for Center employees was accepted as compatible, and both institutions expected to benefit from the analysis.

It was agreed that the Study would be allowed to analyze titles beyond those involved in the Family Health Team if it included all the titles then represented in the Team. The result was a pilot test design that originally included the tasks of thirteen individuals in as many titles. There was only one performer per title because it was considered probable that all or most of the tasks for a title could be identified by working with a single performer in the title.

The Family Health Team

The objectives of the Dr. Martin Luther King, Jr. Health Center with respect to the Family Health Team are that it should provide primary care services to families and that the Team should coordinate the provision of comprehensive health and social-medical services with the provision of medical and social specialty services.

The Family Health Team is considered to be a vehicle which can "expand the scarce resources of the physician through the utilization of other health team members." At the time the pilot test was begun, the basic Team consisted of Family Health Workers, a Nurse Practitioner, an Internist, and a Pediatrician. Sometimes the Obstetrician-Gynecologist was regarded as a member of this core. The Team is focused on the delivery of care to all the members of a family so that the family's functioning as a social unit and the interrelationship of its medical, social and environmental needs and problems can be constantly perceived and taken account of.

The Center, through its Units and clinics, provides the specialty services needed. Since the Center is a division of Montefiore Hospital and is professionally a division of the Albert Einstein College of Medicine, both the Center staff and patients receive the benefits of the related hospital privileges and access to faculty.

The Nurse Practitioner is essentially a public health nurse who is trained as a primary practitioner in pediatric care, obstetrical care, and some adult chronic disease maintenance. The role also included coordination of the Team members.

The Center found that the Team did not automatically function effectively, and considered whether the nurses should receive more clinical training so that they could personally render much of the primary care services to families and also manage the Team. It was also felt that there was a need to train a group of physicians who were interested in making the clinical practice of medicine more social in its orientation, who were sensitive to patients' needs, and who were motivated to learn how to work effectively on a health team. Even before the HSMS was invited to collect task data about the Team, the Center had deemed it important to study the functions of the entire Team prior to any focusing on one member of the Team, especially since leadership and management was involved.

The approach of the Health Services Mobility Study is probably well adapted for some of these purposes because it permits identification of tasks regardless of the titles in which they are found. The insistence on examining titles beyond those of the Team promised to raise certain implications, not only about the paths for upward mobility, but about the relationships between Team and Unit staff and the relationship of each to the families being served. The Units offer clinical care.

The Titles

Figure 1 presents the thirteen titles originally chosen for the pilot test. The titles are arranged in rank order by approximate maximum annual salary level.

After the pilot test work had begun, it became apparent that the difference between the tasks of the Lead X-ray Technician and the X-ray Technician was not one of degree, but of number. That is, the two titles overlap completely with respect to X-ray tasks, but the Lead title includes some semi-supervisory or administrative tasks. Since there was a great time pressure, the tasks were combined, and the Lead X-ray Technician and the X-ray Technician were treated as a single title. Thus, twelve titles remained.

In the case of the two LPN titles it was learned that the LPN is expected to serve in both the Emergency Room and in the Unit at one time or another. Since the tasks are somewhat different in each location, two separate performers were retained. Since the methodology identifies identifical tasks as the same regardless of title, LPN overlap tasks are counted only once in the computer analysis.

Figure 1. TITLES OF PILOT TEST PERFORMERS BY SALARY LEVEL

Annual Maximum Salary Range as of 3/72	Job Title
\$30,000-\$40,000	Radiologist[a] Obstetrician-Gynecologist Internist* Pediatrician*
\$13,000-\$15,000	Nurse Practitioner*[b] Lead X-ray Technician
\$11,000-\$12,999	Nurse Practitioner*[b] X-ray Technician
\$8,000-\$9,000	Family Health Worker* Licensed Practical Nurse-Emergency Room Licensed Practical Nurse-Unit
\$7,000-\$7,999	EKG Technician (Medical Assistant) Medical Assistant-Unit Dark Room Aide

* Asterisk denotes member of Family Health Team.

[a] Actually is employed on a half-time basis.

[b] Nurse Practitioners may receive increments as they complete training in specific areas. The lower salary level includes community health tasks and then rises to cover pediatric care tasks. The upper salary level includes maternal and child care tasks and then rises to cover adult care tasks.

Note of Caution

The twelve titles represented in the data collected reflect the work carried out during the months of April, 1971 through December, 1971. Since only one performer was covered per title for the mostpart, all the possible tasks per title may not have been collected. With only a fraction of the titles represented at the Center covered, it must be emphasized that the resulting task sequences and ladders only suggest the potential of task families. Given that the job structures at the Center are constantly in flux, the reader cannot assume that task assignments to title are still exactly as represented in these data. And, since the task data were not evaluated in normative terms, the reader must not assume that existing task structures represent the ideal or most desirable procedures, structures or performance levels.

THE METHODOLOGY

The chief objective of the HSMS job analysis methodology is to relate job activities (tasks) to one another in families and hierarchies which reflect related, learnable skills and knowledge, and from this information to design job ladders and lattices. The HSMS job analysis method is based on the premise that, if the jobs in a ladder (upgrading sequence) are arranged to reflect rising levels of related skills and knowledge (education), the educational costs and training time between each step on a ladder can be kept to the minimum needed to bridge the gap between the jobs. This would be far less than that required to train for each job "from scratch" or for job sequences unrelated in skills or knowledge.

For this reason, the job task is the basic unit of observation. It is evaluated in terms of the levels of the skills and knowledges required for its performance. The skills as well as the knowledges cover only learnable behavior. The resulting job ladders emphasize the continued use of the skills and knowledges already learned or added to in a progression from one level on a ladder to another.

The Task

The definition of a task in the HSMS method is designed to result in a unit of work which can be moved from one job to another without disrupting other activities. The task is a unit of work which is smaller than that of a job as a whole or, in most cases, than that needed to produce an entire product such as a health service or a manufactured item. The task reflects individual work activities which, in many cases, will be a step leading to or assisting in the production of a final product. The task relates to the performer's output rather than the institution's product. (Products are the units which are sold.)

The task is composed of elements. The element is smaller than the task and is involved in defining the task. The elements of a task are the smallest possible meaningful units of work resulting from physical and/or mental activity. In contrast with the task, elements do not have identifiable, usable outputs which can independently be consumed or used, or which can serve as an input in a further stage of production by an individual other than the performer. A task is identified as follows:

1. The output of a task is the result of an independent stage in a production process in the context of the current organization of work activities in the institution.
2. "What is used" in a task includes all the things which the performer is expected to be able to use or choose from to produce the identified output.
3. The kind of recipient, respondent or co-worker involved in a task reflects the characteristics or condition of the persons involved which determine the knowledge needed on the part of the performer in dealing with them.
4. Individual tasks are identified through the combining of information on output, what is used, and the recipient, respondent or co-worker in a manner compatible with the task definition. Individual tasks are differentiated or judged to be duplications or overlaps of each other based on these data.

The HSMS Definition of a Task

A task is a series or set of work activities (elements) that are needed to produce an identifiable output that can be independently consumed or used, or that can be used as an input in a further stage of production by an individual who may or may not be the performer of the task.

1. In principle, someone other than the performer of the task must be able to use or consume the output of the task.
2. Theoretically, it should be possible for there to be an elapse of time between tasks.
3. A task includes all the possible conditions or circumstances which a single performer is expected to deal with in connection with a single production stage.

4. A task includes all the elements that require continuous judgment or assessment by the same performer in order to assure the quality of the output.

5. A task includes all of the elements needed to produce an output which can be independently used or acted upon without special explanations to the next performer in the next stage of production.

6. A task includes all the elements needed to complete an output to a point at which another performer (who would continue with the next production sequence) would not have to redo any elements in order to continue.

7. A task includes all the elements needed to complete an output to a point at which another performer, in order to continue with the next stage of production, need not perform extra steps.

8. The task must not require that, for another performer to continue with the next stage in a production sequence, current institutional arrangements would have to be changed.

9. A task must be sufficiently broad in statement that it can be rated on its frequency of occurrence. (See Appendix B.3).

10. Two tasks are the same if their elements result in the same output, require the same things to be used (including the alternatives to be chosen among in what is used), and if the kind of recipient, respondent or co-worker involved is the same in terms of what the performer needs to know in order to deal with the person.

The HSMS task definition permits the acknowledgment that much professional level training is used primarily for the emergency or contingency situation, but must nevertheless be accounted for in the task's identification. For example, the task of delivering a baby through the vagina (normal delivery) must contain elements including the decision that complications warrant a change of procedure such as to Caesarian section, the choice of anesthetic, and the possibility of responding to cardiac arrest -- if the performer of the "normal" delivery is the one who must deal with these contingencies.

On the other hand, the definition permits the identification of a task in which the performer notifies a higher level performer of any emergency signs. Thus, the latter task could include only normal delivery and the reporting of complications. The reader will note that these are two different tasks because they require different skills and knowledges, have different outputs, different methods, and involve different co-workers.

Figure 2 is an example of the Task Identification Summary Sheet used to collect task identification data. The List of Elements, found in the right-hand column, describes the elements of the task in detail, and is presented in the sequence in which they are performed. The elements include initiating and terminating actions and any decisions, record keeping, or delegation of duties which are part of the task. In a complicated or high level task the List of Elements can be long and is continued on additional pages. Some tasks have taken as many as six pages.[1]

A narrower level of detail is found on the left-hand side of Figure 2. Items 1, 2, 3 and 4 cover the output, what is used, and the recipient, respondent or co-workers involved in the task.

A still narrower level of task detail that provides a fairly full description is found in the "Name" of the task. This is item 5

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[1] The reader will understand that space does not permit the presentation of the Task Identification Summary Sheets for all the tasks covered in the pilot test. There were 273 tasks, among which there were many which appeared for more than one performer. Under some circumstances these data may be obtained from the Health Services Mobility Study.

Figure 2. EXAMPLE OF TASK IDENTIFICATION SUMMARY SHEET

Performer's Name____________________ Analyst(s)____________________ Dept.________
Job Title____________________________ Institution____________________ Date________

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

   Sutures removed from wound; healing evaluated; medications, bandages ordered or prescribed as needed; recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

   Patient's chart, pen;
   antiseptic, gauze; sterile gloves;
   suture scissors;
   forceps or tweezers; clamps (sterile);
   towels,
   tape, bandages, medications;
   institutional prescription form

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

   Patient needing sutures removed;
   subordinate (RN, LPN, Medical Asst.);
   adult accompanying child patient

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

   Removing a patient's sutures using antiseptic, clamp, scissors, forceps; evaluating healing; deciding on ordering antibiotics, medication, irrigation and/or bandaging; recording on patient's chart.

List Elements Fully

Performer may have decided to remove patient's stitches after having done the suturing originally, or patient may have been referred to performer for removal of stitches.

1. If appropriate, reviews patient's chart. May decide to delegate removal of stitches to RN. If so, gives orders.
2. Orders materials needed from subordinate.
3. Examines skin to note appearance of healing.
4. Explains to patient and/or adult what is to be done. Comforts patient.
5. Puts on sterile gloves. Sterilizes area with antiseptic and gauze.
6. Uses clamp to hold up stitches; cuts sutures with appropriate scissors. Pulls out sutures with forceps or tweezers.
7. Examines wound for signs of infection. May decide to irrigate with antiseptic or order wound irrigated.
8. May decide to prescribe antibiotics and explain to patient and/or adult how to take, or will administer or have subordinate administer. Writes and signs prescriptions.
9. May dress and bandage or have subordinate dress and bandage, specifying what to use and any medications. May order follow-up examination.
10. Enters record of what was done and any medication prescribed on patient's chart.

6. Classify the type of task:
   Preparation ( ) Execution(X) Termination( )

7. Check here if this is a master sheet..(X)

on Figure 2. The "name of the task" is actually a paragraph that summarizes the essential features of the task. Appendix Table A.1 presents the item 5's for the 273 tasks that were identified in the pilot test. Each task is listed by its code number. The same code number is applied to a task regardless of how many job titles in which it is found. There will be briefer task names used in the text of this report, but the task's code number will always be presented so that the reader can refer back to Table A.1 for the fuller discription.

Skills

A skill, in the context of the HSMS method, is displayed in action, in the carrying out of a mental or physical activity; it can be rated in terms of its degree or its level. Knowing how or why things function or what to do to things to make them work is knowledge. Using the knowledge requires skills. That is, one may know how something works, the principles of why it works, or what to do to it to make it work, but one needs skills in the act of applying the knowledge in a job task.

The critical distinction between skill and knowledge, given that they are both treated as learnable, is that knowledge is learned through didactic instructional means. Skills require practice if they are to be learned. Skills may first be presented in an instructional setting such as in a classroom or lecture room, but actual learning does not take place until there is practice. For example, a student nurse can learn the principles and mechanics of giving injections in a lecture setting. She is learning "introductory procedures." However, in order to actually give an injection she must learn and use Object Manipulation skills. These are developed in the course of giving real or simulated injections. As anyone who has ever had black-and-blue injection sites knows, the best injection techniques require a great deal of practice if they are to be done properly.

The literature in the area of performance evaluation, job analysis and testing often treats the concepts of "skill" and "aptitude" as synonymous. For HSMS operational purposes they are distinctly different. The term "aptitude" is used to denote a person's capacity to acquire a skill. It refers to the ease with which an individual can learn a skill or the level of performance he can ultimately achieve in exercising the skill. For example, an individual can be taught the manipulative movements necessary to play a tune on the piano. Through practice he can acquire the skill of playing the piano. The ease and speed with which he learns and the eventual quality of his playing, however, is a function of his aptitude for music, covering both the knowledge and the skills involved in playing.

Scales

The HSMS method identifies sixteen learnable skills. Of these, three are manual; two are interpersonal; three relate to precision in the use of language; two deal with decision making; four cover general intellectual skills; and two are responsibility skills which relate to the recognition of the consequences of error in task performance. Each of the skills is represented by a scale.

Each of the HSMS scales has a name, an overall statement of its content, and an indication of what criteria (scaling principles) are to be used to differentiate each of its various numerical levels. Each numerical scale value (which can range from 0.0 to 9.0) is accompanied by a statement (descriptor) which describes the behavior warranting that descriptor's scale value. The descriptors use generic language, so they can be used for any task, in any industry.

The first descriptor for each scale is at the zero point. The descriptor at zero contains more than the simple statement that the particular skill is not involved. Each suggests the necessary minimum condition which must be met before a task can be rated above zero on the scale. The minimum condition for non-zero levels of the skill scales are at levels above expected, common behavior attainable with maturation. This is true for each zero point descriptor on each scale. Thus, the zero point descriptor assures that non-zero levels of the skills represent learnable attributes that are worth considering for clustering tasks and for designing curricula.

For each scale the minimum condition represents the key aspect of a quality which must be present. This quality and one or more additional qualities determine the way in which the levels of the scale rise. Each descriptor represents a level described in terms of the scaling principles involved. In some scales more than one principle is involved. The descriptors for the scale represent combinations of the levels of the principles which can be expected to be found in work situations.

The HSMS Skill Scales

Figure 3 presents an example of one of the HSMS skill scales. The reader will note that it has a name, an introductory statement about its content and scaling principles, and a series of numbered descriptors. The scale value of the descriptors for each scale and the actual number of descriptors used in the scale was determined by a statistical procedure called "equal appearing intervals," or Thurstone Scaling. Each scale was also designed to be self-evidently cumulative; that is, each scale level encompasses all the scale levels below it with respect to the skill involved.

The HSMS method identifies three manual skills which appear to be learnable through practice. They each deal with precision and coordination in the use of the body or its parts, and are essentially psychomotor skills. Locomotion deals with the body's movement through space; Object Manipulation deals with the movement, control and placement of objects, and Guiding or Steering deals with the control of objects moving in space in relation to external stimuli. All three are needed at non-zero levels once the task requires that some sort of predetermined standard be achieved.

The HSMS method includes two interpersonal skills. One deals with Human Interaction (Figure 3). It is exercised whenever a task requires the performer to come into contact with, or interact with, other persons. The second deals with Leadership, and is exercised whenever a task requires the performer to relate to subordinates so as to influence their work behavior.

Figure 3. THE HUMAN INTERACTION SCALE

This skill refers to the degree of sensitivity to others required of the performer in the task being scaled. The skill involves the performer's perception of the relevant characteristics or state of being of the other person(s), the performer's attention to feedback as the interaction occurs, and the performer's appropriate modification of his behavior so as to accomplish the task. The skill is involved if the task requires any personal contact or interaction with others. The scale value of this skill rises as the degree of perceptiveness and sensitivity required of the performer rises, and as the subtlety of the feedback to which he must respond increases.

The level of this scale should not be determined by the level of knowledge required in the task.

SCALE VALUE	DESCRIPTIVE STATEMENT
0	The task does not require the performer to be in contact with or to interact with other people.
1	The task requires the performer only to be in general contact with other people. Very little sensitivity or awareness of feedback is required other than the need to take account of them in the performance of the task.
-	
3	The task requires the performer to interact with others in the performance of the task. The performer is required to be somewhat sensitive to the other person(s)' relevant general characteristics or state of being and to be aware of very obvious feedback so as to adjust his behavior accordingly.
-	
5	The task requires the performer to interact with others in the performance of the task. The performer is required to be quite sensitive to the other person(s)' relevant characteristics or state of being, and to be aware of fairly obvious feedback so as to adjust his behavior accordingly.
-	
7	The task requires the performer to interact with others in the performance of the task. The performer is required to be keenly sensitive to and perceptive of the other person(s)' relevant characteristics or state of being, and to be aware of fairly subtle or complex feedback so as to adjust his behavior accordingly.
-	
9	The task requires the performer to interact with others in the performance of the task. The performer is required to be keenly sensitive to and perceptive of the other person(s)' relevant characteristics or state of being, and to be acutely aware of very subtle or very complex feedback so as to adjust his behavior accordingly.

Both of these scales have scaling principles which describe the conditions under which the skill must be exercised, rather than the way the skills are manifested or the nature of the skills. This is because interpersonal skills may be exercised in ways that are unique to the performer, and reflect his individual personality. However, the skills do require behavior which can be learned by being practiced, regardless of the specific manner in which they are displayed. Thus, the levels of the skills, as called for in tasks, are a basis for task clustering.

There are three HSMS language skills. The language skills deal with the precision with which the performer uses language to conve, meaning, independent of the knowledge he must have in order to use technical vocabulary. The language skills do not refer to knowledge of vocabulary. (Technical language is accounted for by the knowledge categories identified for the task.) The language skills also do not refer to knowledge of grammar, semantics, linguistics or literary form. Rather, the language skills deal with the level of precision required in the use of language to convey meaning. As with any other skills, they are learned through practice. The language skills cover Oral Use of Language, Reading Use of Language and Written Use of Language.

The HSMS method treats decision making responsibilities as decision making skills. The exercise of responsibilities may involve any number of other skills, but having to exercise the responsibilities, the fact that tasks require decisions to be made, involves use of decision making skills which can be learned through practice. There are two decision making skills. Decision Making on Methods is relevant for any task except when the output is achieved in a totally pre-determined fashion so that the performer exercises no choice over methods whatsoever. Decision Making on Quality is applied to any task, assuming generally correct performance, whenever the performer can have some effect on the quality of his output.

The four HSMS General Intellectual Skills are called Figural Skills, Symbolic Skills, Taxonomic Skills and Implicative Skills. They cover task behavior such as dealing with the size, shape or form of things to achieve a figural standard; the mental manipulation of abstract symbols which are parts of systems of notation; the conscious application of, or creation of, conceptual classifying or organizing principles; and the drawing of non-obvious conclusions or inferences from information. These skills are learnable through practice and transferable from one task situation to another. Since General Intellectual Skills are usually learned and exercised in the application of knowledge, they can be confused with knowledge. But the knowledge actually serves as a vehicle through which the skills are learned and practiced. Thus, tasks which require diverse knowledge or subject matter may have in common some of the General Intellectual Skills necessary to apply the knowledge, and the skills are valid for use in clustering tasks.

Every task normally carries with it the danger that the performer will make errors in carrying it out. The performer's awareness of the seriousness of possible errors serves to keep him alert in the performance of the task. This sense of responsibility is learnable, and, as such, is treated as a skill on the basis of which tasks can be clustered. The HSMS method includes two such skills. One deals with the Financial Consequences of Error; the second deals with Consequences of Error to Humans. Both scales describe levels of seriousness of the consequences of an error considered to be the most serious, likely error for the task that can be made by a performer qualified to do the task.

Appendix Table A.2 presents the introductory paragraph for each of the HSMS scales and the number of tasks in the pilot test which were rated above zero on each of the scales.

The Knowledge Classification System

Since the aim of the HSMS task analysis method is to minimize the educational or training distances between jobs in job ladders, the method pays attention to knowledge as well as skills. The more that tasks require academically based advanced, or specialized knowledge, the greater the investment needed in education and training to perform them, and the more important it is to build ladders based on knowledge as well as skills. The concepts and definitions used for the HSMS Knowledge Classification System and its Knowledge Scale reflect the method's need to treat knowledge categories as variables which can be uniquely identified regardless of task and which can be treated as scalable in a manner similar to the HSMS skills.

Knowledge is information about facts and concepts and includes how or why things function or what to do to have them function. Knowledge may be acquired by formal didactic means such as in a classroom, or by less formal means such as self-study, personalized instruction, or by watching others.

The definitions and the categories which are part of the HSMS Knowledge Classification System reflect the uses of knowledge in work settings. The groupings of the categories reflect their functional uses. The categories were conceived of and devised to be additive and scalable in the same way in which the HSMS skills are additive and scalable (rising from low to high levels cumulatively, according to scaling principles). The categories require the effort of being learned in the context of a curriculum, and they can be applied in more than one setting.

The concept of the transferability of knowledge assumes that some kinds of knowledge are capable of being used in varying situations and that some kinds of knowledge are additive from lower to higher levels, i.e., that knowledge is scalable. The concepts of transferability and scalability of knowledge underlie the HSMS Knowledge Classification System.

The HSMS Knowledge Classification System's categories are limited to the following types of knowledge:

1. Subject categories which represent organized bodies of knowledge which can be conceived of as ranging in content

from simple to advanced levels and which can be required at varying levels in a variety of tasks.

2. Subject categories which are not merely the names of the individual steps of tasks.

3. Subject categories which, even at lowest levels of use, require a learning effort beyond every day experience and beyond the usual process of maturation. The learning effort involved may be formal or informal, but it must involve a conscious effort to be acquired so that it can be applied in different situations.

4. Subject categories which can be identified as being required in competent task performance.

Excluded are the procedures or arrangements characteristic of a particular institution (orientation knowledge). Such knowledge is learned in terms of "first you do this, and then you do that" and is not transferable. Also excluded is knowledge which cannot be scaled from low to high levels, and curriculum contents not applicable to work situations.

The subject categories which make up the Knowledge Classification System are presented in an outline form, in a system of progressive indentation. Each category has a unique, 8-digit identification code. The broadest level of the outline has a non-zero digit in the far left position. The progressive indentations continue the prior levels' digits, and have a non-zero digit in the position corresponding to the category's respective level of indentation. The categories are no more finely broken down than it was expected would be needed to identify in the field and scale. Figure 4 is a page from the Knowledge Classification System and indicates the way the system is laid out.

Figure 4. SAMPLE PAGE FROM THE KNOWLEDGE CLASSIFICATION SYSTEM

	1 2 3 4 5 6 7 8
10000000	NATURAL SCIENCES
11000000	BIOLOGICAL SCIENCES
11100000	# History of the biological sciences*
11200000	# Genetics (For molecular and microbial genetics see Molecular biology.)*
11300000	# Evolution*
11400000	# Biogeography*
11500000	# Ecology (Includes ecosystems and conservation.) (For the physical aspects of air pollution see GEOSCIENCES, CHEMISTRY, PHYSICS, and ENGINEERING AND TECHNOLOGY; for the health aspects of pollution see Community health and preventive medicine and Epidemiology.)
11600000	# Botany*
11700000	Zoology
11710000	# Invertebrate zoology*
11720000	# Vertebrate zoology (through mammalia, but excluding humans)*
11730000	Human zoology
11731000	Normal structure and function (The categories listed below include both anatomy and physiology except where otherwise specified.)
11731100	# Regional anatomy (Includes head and neck, thorax (back) and abdomen, pelvis and perineum, lower and upper limbs, and skeleton.)
11731200	# Topographic anatomy (relation of external manifestations to internal structure and function, e.g. location of pressure points, surface appearance of joints, muscles and bones.)
11731300	# Hematopoietic system (Includes blood, red and white blood cells, platelets,and and bone marrow, liver and spleen in their blood forming function.)

Only those categories which have a number sign (#) or are underlined (or both) are used for identification purposes. (The reason is related to the statistical need to turn categories into variables for clustering tasks.) The categories with number signs are called _fine level categories_; those that are underlined are _broad level categories_. In some cases categories have not been further subdivided even though they are broad; some broad categories are fine with respect to still broader categories. Such categories have both number signs and underlining. (Categories which will clearly warrant elaboration of subdivisions in future work are indicated with asterisks.)

When a job analyst identifies a category for a task he must consider its related broad-level category if the one chosen is fine; and must consider all its fine-level subdivisions if the one chosen is broad. This rule does not mean that the analyst _must_ identify the broad (or the fine), but that he must _consider_ whether the category is (are) required for the task.

The Knowledge Scale

One of the criteria for inclusion of a category as "knowledge" in the Knowledge Classification System is that tasks must conceivably require the category at varying levels. Thus, a category must be "scalable." The HSMS method uses a single scale for measuring the levels of all categories. Figure 5 presents the Levels of Knowledge scale. As with the skill scales, the Knowledge Scale has a name, an overall statement of its content, and an indication of what scaling principles are to

Figure 5. THE LEVELS OF KNOWLEDGE SCALE

This scale refers to the level of knowledge in a given subject category required of the performer in the task being scaled. The knowledge categories which are required for each task are identified, and each category is rated with this scale. To be rated above zero on the scale the task must require knowledge beyond the simple memorization of the overt steps of the task. The scale rises with the amount of detailed knowledge which must be consciously applied and with the depth of understanding required in the subject area, in terms of its content, the structure of its ideas and its uses. "Detailed knowledge" covers such things as technical or special terms or facts. "Consciously applied" means that the performer is able to (but need not) articulate his use of the knowledge in the task situation.

The level of a knowledge category should not be determined by the task's level on other knowledge categories or that required in other tasks in the job using the same knowledge category, nor by the level of General Intellectual skills which may be involved.

SCALE VALUE	DESCRIPTIVE STATEMENT
0.0	The task does not require the performer to consciously apply knowledge in this subject category which has been gained in a learning experience requiring more than the memorization of the overt steps of the specific task being scaled.
--	
--	
1.5	The task requires that the performer consciously apply a limited amount of detailed knowledge in this subject category, including such things as technical or special terms or facts.
--	
2.5	The task requires that the performer have a general awareness of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a limited amount of detailed knowledge in this subject area, including such things as technical or special terms or facts.
--	
3.5	The task requires that the performer have a general awarenesss of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a moderate amount of detailed knowledge in this subject area, including such things as technical or special terms or facts.
--	
--	
--	
5.5	The task requires that the performer have a considerable degree of understanding of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a moderate amount of detailed knowledge in this area, including such things as technical or special terms or facts.

(continued on next page)

Figure 5. THE LEVELS OF KNOWLEDGE SCALE (continued)

SCALE VALUE	DESCRIPTIVE STATEMENT
--	
--	
7.0	The task requires that the performer have a considerable degree of understanding of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a very great amount of detailed knowledge in this subject area, including such things as technical or special terms or facts.
--	
8.0	The task requires that the performer have a very deep understanding of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a moderate amount of detailed knowledge in this subject area, including such things as technical or special terms or facts.
--	
9.0	The task requires that the performer have a very deep understanding of this subject category in terms of its content, the structure of its ideas, and its uses. The performer must consciously apply a very great amount of detailed knowledge in this subject area, including such things as technical or special terms or facts.

be used to differentiate each of its various numerical levels. Each numerical scale value (which can range from 0.0 to 9.0) is accompanied by a descriptive statement (descriptor) which describes the behavior warranting that descriptor's scale value. The descriptors use generic language, and can be used for any knowledge category.

The Knowledge Scale has two scaling principles and a minimum condition which must be met before a category can be identified at a non-zero level on the scale. The minimum condition is that the knowledge must take some expenditure of time and effort to acquire, so the knowledge is usable in another context; i.e., that it is transferable.

The two scaling principles deal with (1) breadth of knowledge and (2) depth of knowledge. The first scaling principle (breadth), reflects the minimum condition for a non-zero value on the scale. Breadth of knowledge, refers to the amount of detailed knowledge the performer must know about the subject. This covers the variety of topics, facts, procedures or other aspects of information covered by the subject. The second scaling principle deals with depth of understanding. It rises from "general awareness" to "considerable degree of understanding," to "a very deep understanding." The nature of the category determines the way depth of understanding is manifested, but depth of understanding always refers to the comprehension of the "hows," "whys," and "whats" of the subject.

Appendix Table A.3 presents the 201 separate knowledge categories that were identified for one or more of the pilot test tasks. It also presents for each the number of tasks which required the category at some level above zero on the scale. Further references to knowledge categories will utilize abbreviated versions of the names presented in Table A.3; the reader can refer to these longer names by making use of the 8-digit code number of the category which is always presented with the category name.

Data Collection

Task analysis using the HSMS method proceeds in a series of stages. It is carried out by a team of two or more job analysis who are trained in the methodology. The method is designed to be learnable by persons who are not themselves health practitioners so that it can be part of the central manpower function of an institution. Prior to their field work, the analysts inform themselves of the general content of the jobs they will cover.

The methodology includes laying a groundwork during the scheduling period. During this time the analysts ensure that information about the task analysis work is disseminated to all the managerial levels that must be involved in arranging interview time with the performers. The performers themselves are met and informed about the task analysis. Where unions are involved, their cooperation is obtained.

The data collection begins with task identification, which is done primarily through interviews with the performer, but which allows for some observation of tasks that are hard to describe.

The sequences in task identification are as follows:

1. A team of at least two job analysts is required for task identification. The team must agree on the identifications, based on interviews (and observation). These identifications are entered on Task Identification Summary Sheets.
2. The preliminary identifications are submitted to the Director of the Project, who edits them for language usage and clarity, but who also reviews the identifications for conformity to the definition, and for completeness of information. A conference is held with the analysts involved, and, if any ambiguities remain, the analysts go back to the performer for further information.
3. The revised tasks are submitted to an expert at the institution, "the resource person," who reviews the tasks for accuracy in use of technical language, accuracy in procedural descriptions, and possibilities of task omissions. If the analysts cannot accept the changes or answer the questions, they go back to the performer for further information.
4. The revised tasks are presented to the performer for his approval. The analysts delete anything not done by the performer (or by someone in the title), make changes, and otherwise bring the tasks into closer conformity with what is actually being done by the performer or incumbents in the title.

After task identification, the revised tasks are the data base for which skill and knowledge data are collected. Skill scaling data and knowledge identification and knowledge scaling data are also collected in a series of interviews with the performer. In each case the team of analysts must agree about its final judgments. These are later reviewed for consistency.

Ideally, the skill and knowledge data should also be reviewed by a "resource person." In the case of the pilot test this was done by the Director of the Project and two general consultants. For this reason, the specific data on skills and knowledge are to be considered generally indicative rather than normative. They are subject to modification with respect to scale levels and inclusion or exclusion of specific knowledge categories for specific tasks.

Preparation of Data

The HSMS method for clustering tasks into related skill and knowledge hierarchies uses a computer-based, advanced form of factor analysis. In the programs used the unit of observation is the task. Each task has a scale value on each skill scale, and a value on the knowledge scale for every knowledge category identified for any of the tasks being studied. The variables are the skills and the knowledge categories.

The data collected in the field are coded with identification information for each task and with the skill and knowledge data for each. There are an undefined number of data cards for the tasks. The first card tells the computer how many cards will follow for a given task. The next card is in a fixed format, and presents the scale values for each of the 16 skill scales for the task. Any other cards are numbered consecutively and are set up so that the ID number of the knowledge categories identified for the particular task are entered along with the scale values for each.

The HSMS Edit program receives the data cards in any task order, but always with the cards for a given task (observation) in numerical order by card number, beginning with the first card. The Edit program then performs the following functions:

1. A check is made to be sure that all scale values are in the correct range; i.e., it checks for gross keypunch errors.

2. A check is made to be sure that no task appears more than once; i.e., that only one set of data per task ID number will be "read in" to the computer.

3. The program "reads in" the tasks' scale values for the skill variables from the fixed format, and assigns ID numbers from 1 to 16 to the skill variables.

4. The program "reads in" the tasks' knowledge category values. This is done in a process which acknowledges and assigns a location to each different 8-digit knowledge category identification code, and assigns a variable number to each different one, starting from 17. For each category identified but not found for a given task, a scale value of zero is assigned by the computer.

5. The program produces a printed output which indicates what the variables are, from 1 to 16 as skills, and from 17 to n, depending on the number of knowledge categories involved. It allows the user to delete knowledge categories that do not appear on a sufficient number of tasks or to delete specific categories. It also shows the task locations and scale values for each knowledge category identified.

6. The program provides the user with the option of utilizing another program which "normalizes" the data. This is a nonlinear transformation performed on the data to bring them into a closer approximation to a "normal distribution." No major distortion of the data is involved, but the statistical problems encountered with a proliferation of zeros (when a large number of knowledge categories scale at zero for many tasks) can be avoided.

7. The program places the final data onto tape files, where they are then inputs for the actual steps of factor analysis.

Factor Analysis of Variables (Skills and Knowledge)

Factor analysis deals with observations and variables. It examines the statistical relationship of every variable with every other variable, and groups these in such a way as to best account for all the variability represented by the ratings of all the observations (tasks) on all the variables. A factor solution essentially groups related variables into arrangements which explain the data with fewer concepts than the sum of the original variables. A given factor essentially replaces a group of interrelated variables with a single construct which expresses the interrelationship within the group. Factor analysis usually results in the creation of two or more factors from a much larger number of variables.

In the case of the HSMS pilot test, 16 skills and 201 knowledge categories were the variables, and 273 tasks were the observations. (Duplicate or overlap tasks were not represented more than once, since each task code number is represented only once.)

The first stage of the factor analysis creates the "variable factors." These are determined by those skills and knowledges which tend to be interrelated and therefore can be expected to rise and fall together. This means that, for the purpose of curricula, variables which factor together should tend to be taught together, since they are usually needed at interrelated levels on their respective scales.

Since every variable is rated on every factor, what determines a variable factor are those variables which "load high" on the factor. Variables can load on factors within the range of ± .99. Variables which are positively interrelated on a factor will have the same sign. The + or - has no other intrinsic meaning.

Given the nature of the computer core storage needs for factor analysis, 217 variables are well beyond the limits of most computers. The HSMS program limits the user to 144. The 217 variables were easily reduced to 144, since it was obvious that a knowledge category must be required for a sufficient number of tasks to be relevant for job ladders. By using nine tasks or fewer as a cut-off point, a sufficient number of variables were eliminated.

Even 144 variables provide a problem with respect to interpretation and the selection of an optimum number of factors in the acceptable "solution." One criterion used is that the number of factors chosen must result in most variables having high loadings on only one factor, with each factor having several variables which load high on it. Another criterion used is that the factors chosen show stability in their high-loading variables across several factor solutions. The most important criterion, however, is that the factors must make sense.

Factor Analysis of Tasks

The procedure used for clustering the tasks is a modified version of the Tucker-Messick procedure for factoring an individual differences matrix.[2] The procedure was developed at the university of Illinois by E. E. Davis, H. C. Triandis, and L. Tucker. The HSMS version is a new application and modification of the original technique[3]. The program's essential feature is that it permits the extraction of principal axis factors for both observations and variables (two modes), based on a co-variance or a correlation matrix of variables. It is then possible to rotate the variable mode to "simple structure" by a Varimax routine, and "counter-rotate" the observation mode (tasks).[4] This method has been dubbed "two-mode" factor analysis, while the simple factoring of variables is called "simple" factor analysis.

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[2] Ledyard R. Tucker and Samuel Messick, "An Individual Differences Model for Multidimensional Scaling," Psychometrika, Vol. 28, December, 1963, 333-367.

The decision determining the number of factors in the simple factoring of the variables determines the number of factors for the tasks. In fact, it is the interrelationships among the variables on a simple factor that determines a task's loadings on a given factor. In this report the variable factors are referred to in Roman numerals, while the task factors are referred in the words for the numbers. That is, Factor I for variables is reflected in the tasks of Factor One.

The "two-mode" program results in a print-out of the desired variable factors and the counter-rotated task factor solution. The output lists the tasks by code number and provides each task's loadings on each factor.

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[3] E. E. Davis and H. C. Triandis, An Exploratory Study of Intercultural Negotiations, Technical Report #26, ONR Contract #177-472, Nonr-1834(36), Urbana: University of Illinois, 1965.

[4] Counter rotation is done by obtaining the transformed characteristic vectors of the observation mode induced by the Varimax rotations of the variable mode.

The loadings of the tasks on factors are interpreted as follows. The sign of the variables (plus or minus) which makes up a given factor's chief character on the variable factor solution determines the sign to consider for the loading of tasks on the corresponding task factor. A task's loading on the factor is due to the combination of the variables present for the task, their loading on the corresponding variable factor and the scale values in the task for the variables. If a factor's characteristic sign is positive, tasks can load at any relatively high level such as 3.00 or 5.00 or can load at levels as low as .01 or .02. Tasks can also load at -.01 or -.5.00, which is much lower.

The rank order loading of tasks on factors is obtained by the tasks' arrangement from high to low within the characteristic sign, through zero, and from low to high in the opposite sign. These loadings are not normalized, and serve only as relative measures. This arrantement of tasks into hierarchies makes it possible to determine on which factor a task loads highest, as well as the relative order of tasks on a factor.

Task Sequences

Task sequences are obtained by first assigning tasks to the one or two factors on which they load highest. The skill and knowledge content and scale levels for these tasks are examined once they are arranged in ascending order of their loading on the factor.

From inspection of tasks'skill and knowledge requirements and the scale levels involved it is possible to determine various stages or "levels" which would correspond to general educational levels. Seven levels were identified in connection with the pilot test.

IDENTIFICATION OF GROSS CURRICULUM OVERLAP

During the pilot test an attempt was made to locate the educational programs which account for the tasks studied and to explore possibilities that performers in some of the Center titles might be able to receive credits in academic institutions for the training they received at the Center. It was also decided to explore any indications, through the tasks being studied, that existing programs have a degree of overlap. The time available for this work did not allow any sampling of programs. Rather, one program of each kind mentioned was studied. The results of the test are therefore to be considered indicative or suggestive rather than totally representative.

Programs Involved

HSMS staff (to be referred to as curriculum analysts) identified a program to represent each type of credentialed training relevant to the titles studied in the pilot test. These included a medical school (It was decided not to go higher than this at this time.), three nursing programs (baccalaureate, diploma and associate degree), a program in radiologic technology, and an LPN program. Staff also contacted the Center's own training programs which cover Medical Assistant, Family Health Worker, and Nurse Practitioner. For each program a respondent or consultant was enlisted to cooperate in research to explore areas of curriculum overlap.

Procedures

The analysts worked with the task names as represented in item 5 on the Task Identification Summary Sheets. These were modified as follows:

1. Only one instance of a task could be represented.
2. Tasks which could not be easily differentiated from the point of view of curricula were merged.
3. Tasks which were so institutionally oriented that they could not possibly be reflected in formal curricula were eliminated.
4. The remaining task names were edited so as to eliminate specific references to the performer's title and edited to eliminate peripheral steps which could confuse the respondent when he or she was asked whether his curriculum covers the information needed to perform the task. Such steps as pick-up, delivery, or filling out institutional forms were deleted.

The same Task Content Instrument was presented to each respondent, who was personally instructed in its use. Appendix B.1 presents the Task Content Instrument used in the pilot test. It presents the edited task names and a selection of answers from which the respondent chose the best description of his program's relationship to the informational content of each task. The respondent had a choice of one of seven responses to choose from for each task listed. Item (f) allowed the respondent to disqualify himself with respect to a given task, and item (g) allowed the respondent to require further elaboration of the content of the task. Items (a) through (c) are written in such a way that the educator is not forced to make a distinction between clinical training and academic training. The seven items were as follows:

CHOOSE ONE ITEM FOR EACH TASK

a. Curriculum covers all or most of the specific procedures of the task or all or most of the subject matter applied in the performance of the task.

b. Curriculum covers a significant amount of the procedures of the task or a significant amount of the subject matter applied in the performance of the task.

c. Curriculum covers a small amount of the procedures of the task or a small amount of the subject matter applied in the performance of the task.

d. Curriculum has no relationship to or bearing on the task.

e. The content of the task must have been mastered before the student is permitted to enroll in the curriculum program.

f. I do not know the relationship between the program and the task.

g. I need more information about the task.

The first set of collected data were nine completed sets of the Task Content Instrument, each referring to the same set of tasks. The results were then tabulated for the tasks by program,according to the letters (a) through (e) chosen by the respondent. In this way, a profile for each job title was developed, indicating in which program(s) the tasks of the job title are covered to some degree or another.

It was expected that a curriculum program bearing the name of the job title would include most of the tasks covered by the title, with some being covered by lower-level programs. What the analysts looked for were the letters (a) through (c) found in any of the columns representing higher-level programs.

The curriculum analysts then judged whether the evidence of overlap for a given job title's tasks in programs above its own level warranted further exploration. The second part of the test was to find out whether there was gross evidence of any significant degree of overlap, based on the first results.

For each job title, the curriculum analysts assessed whether there were programs with sufficient evidence of significant overlap to warrant asking the respondent how big a portion of his curriculum was involved in the tasks of given performers.

"Significant overlap" in this context meant the probability that some advanced standing to shorten training time might be justified. Any number of tasks which might manifestly take minutes to teach would not add up to "significant overlap."

The curriculum analysts then prepared a separate Curriculum Significance Rating Instrument for each respondent, for each lower-level job title for which there was evidence that significant overlap existed. This meant that, if there were more than one lower-level title with evidence of overlap with a given program, a separate Curriculum Significance Rating Instrument was prepared for each. Any given respondent could have more than one Curriculum Significance Rating Instrument with which to deal. In addition to these Instruments,overlap from program to program was explored, reflecting all the tasks accounted for by one program,regardless of job title, which were also accounted for by the higher-level program.

The Curriculum Significance Rating Instrument was composed of (1) general instructions: (2) the set of task descriptions which were checked (a), (b) or (c) earlier by the respondent and which were found among the tasks of a given job title below the level of the one referred to by the program; and (3) a rating scale on which the respondent indicated the portion of his curriculum accounted for by the training needed for the tasks listed. Appendix B.2 presents the instruction sheet and the rating scale for the Instrument. The rating scale is as follows:

CURRICULUM SIGNIFICANCE RATING SCALE

5..( )...The section of curriculum represented amounts to several courses or more in the program.

4..( )...The section of curriculum represented amounts to an entire course or major portions of several courses in the program.

3..( )...The section of curriculum represented amounts to a major portion of a course or minor portions of several courses in the program.

2..( )...The section of curriculum represented amounts to a minor portion of a course in the program.

1..( )...The section of curriculum represented amounts to a negligible portion of a course or several courses in the program.

The data collected with the use of the Curriculum Significance Rating Instrument indicate to what extent the educators in the "accepting" institution or program implicitly acknowledge the possibility of overlap with lower-level programs. Any rating of 3 or higher on the scale would warrant following up with more detailed analysis or negotiations between the institutions. Detailed analysis would be needed to determine whether the curriculum being taught at one level and dealing with a given task content is actually the same or different from that taught at another level dealing with the same task. The pilot test period did not go on to a more detailed analysis.

RELATED DOCUMENTS

The HSMS job analysis methodology is reported in Research Report No. 3: A Job Analysis Method for Developing Job Ladders and for Manpower Planning. There are nine volumes. Part A deals with task identification: Part B deals with skills and scales; and Part C deals with the Knowledge Classification System. Each of these three Parts consists of three volumes. One presents the method; one is a training manual for the job analyst; and one presents statistical results of the field tests, aspects of data processing, or other relevant background information. This report is not yet available for wide distribution since the methodology is still subject to revision.

The HSMS curriculum analysis methodology is available under limited distribution in preliminary form. Working Paper No. 10, Preliminary Models for Curriculum Analysis and Curriculum Ladder Design contains the outline for the work done thus far. Research Report No. 6, A Model For Use of Task Data in Performance Evaluation and Trainee Selection covers the use of the HSMS data for normative evaluation of work performance and related uses. It is also available under limited distribution.

CHAPTER 3

GENERAL RESULTS OF THE PILOT TEST

This chapter discusses the general results of the pilot test. It covers the workability of the method, the characteristics of the variable factors and the characteristics of the task factors.

WORKABILITY OF THE METHODOLOGY

The pilot test provided the opportunity to test the methodology as an entire system. For the first time, a job analysis methodology was applied to all levels of job titles within an institution. As a result of applying the method as a system, it was possible to further develop the methodology and to gain insights into the general characteristics of the tasks.

Task Identification

The most difficult area of task identification was the application of the definition to professional level jobs, especially, physicians' jobs. The reason is that patients' specific conditions are myriad, and the actual nature of a particular patient's condition is usually not known until the examination is done. In many cases the physician will examine, take specimens, judge condition, delegate procedures to subordinates, and treat the condition during one continuous time period. In other cases only the most routine, minimal amount of examination is done. Applying the concept that the task's boundaries are set by the need for continuity of the same performer's attention or judgment, a rough outline about the types of tasks to be expected at the professional level and their component elements was evolved.

There are usually two key types of tasks for the physician. The primary task's chief output is the diagnosis of the patient's condition and the determination of a course of treatment if there is a diagnosis of pathology. Variations of this same task occur when the physician cannot complete the task and refers the patient elsewhere, when the patient is diagnosed as being well, or when the patient had been referred by another with a review of the case needed rather than an initial workup. The same task covers initial examination or revisit, diagnosis and prescription; it covers response to an acute condition, a chronic condition or a health check-up. These different initiating elements create variations of the same task.

The differences among physicians' tasks is in the scope of the performer's area of diagnosis. The Internist's recipient is a "non-child patient." The Pediatrician deals with the "pediatric patient;" and the Obstetrician-Gynecologist deals with "female patients." At the level of the Nurse Practitioner, diagnosis is replaced by "identification of abnormal conditions."

There is a basic framework for the primary task in which there are decisions to personally do or to delegate aspects of examination, recording, and specimen taking to others. Thus, it is more probable to find that the physician's task elements overlap with lower level functions than that the whole task overlaps. Each delegatable element becomes a task for a subordinate, with its own limited output. The physician's primary task is tied together by the fact that one single person must decide on the patient's condition and decide what to do. The basic outline for the diagnosis and prescription task is presented below. Not every step is included in every instance of the task.

1. Initiating element (description of all conditions which can bring the patient to the performer).
2. Review of information (referral, chart, case history, or collection of new data).
3. Interview with patient to gain information about condition.
4. Decision by performer on what examination procedures to follow and what specimens to take while examining, or:

   Decision on immediate referral.
5. Decision on delegation of aspects of examination or specimen taking.
6. Explanation to patient of what will be done.
7. Examination and specimen-taking, divided by parts of the body and/or functions.
8. Continued discussion with patient to gain information about condition.
9. Review of findings to decide whether more information is needed. If needed, ordering of tests or referring for tests.
10. Arrival at diagnosis and decision on course of action. Assessment of immediacy of care needed; delegation of action or referral; writing of prescriptions.
11. Discussion, instruction and counseling of patient regarding 9 or 10, above.

12. Prescription of special diet if appropriate.
13. Provision of reinforcement, reassurance.
14. Decision on follow-up by subordinates, or revisit, or personal follow-up.
15. Checking back with Dr. or counselor if patient was referred.
16. Recording.

The basic diagnosis and prescription tasks in the pilot test are tasks 9, 39 and 55. The Nurse Practitioner's counterpart tasks are 83, 85, 86, 88 and 89. (See Appendix A, Table A.1.)

The second key task of the physician has many variations. It is the administration of a course of care or treatment. It is separated from the diagnosis task because, though it may follow the latter immediately in time, it can be done by a different performer. The treatment tasks usually require a review of the prescribed care unless the same performer has just determined the course of action.

The performer decides whether the prescribed care is still warranted based on a review of information and consideration of contraindications. He then may delegate the actual administration of medication or treatment or may perform specific treatments himself.

There are as many types of "decision whether to go ahead with treatment and doing treatment" tasks as the performer's areas of competence and type of patient allow. Some are grouped together in one task. Thus,"administering medications"may cover all the types of administration possible. "Care of injuries"is grouped, but"suture"is treated as a separate task. In each treatment task the decision to do it has come about in the diagnosis and prescription task of the performer (or some other performer). Where review of the prescribed treatment is involved, it is in the treatment task.

Performance of chemical tests, interpreting lab slides, and similar activities are treated as separate tasks if the continuity of the performer for a diagnostic output is not required. Reading a patient's X-rays is part of the physician's diagnosis task, but interpreting an X-ray for another physician is a separate task according to the definition.

Teaching, supervisory, administrative, and conference tasks are separately identified even when teaching is done in connection with providing patient care. The elements of the teaching tasks may or may not include planning, evaluating students, examining, and deciding when the student can have duties assigned.

Tasks involving surgery, when the performer leads the operation, include the pre-surgery examination, decision on whether to go ahead, delegation of procedures to others during surgery, and dealing with any emergencies or post-operative problems. The insight that surgery is essentially a task of continued diagnosis and prescription before, during, and after the operative procedures are actually carried out, was gained during the pilot test. (Surgery is done at the hospital after being prescribed.)

The pilot test resulted in the identification of 273 separate tasks, some of which were found in more than one performer's job. (One task, code number 227, was a "dummy" task. It was added to use the code number when it was discovered that the number had inadvertently not been assigned to any task. Thus, there were really 272 tasks.)

The number of tasks per performer were as follows:

Job Title	Number of Tasks
Radiologist	8
Internist	30
Obstetrician-Gynecologist	21
Pediatrician	26
Nurse Practitioner	46
Lead X-ray tech, X-ray tech.	18
Family Health Worker	63
LPN (Emergency Room and Unit)	82[a]
EKG Technician	12
Medical Assistant-Unit	34
Dark Room Aide	9
Total Tasks:	273

[a] LPN-Emergency: 53; LPN-Unit: 51. There are 21 overlap tasks between the two LPN titles.

Skills and Knowledge

The pilot test period indicated that the analysts could apply the scales with little difficulty, and that the language of the Knowledge System could be understood and applied provided that the job analysts were careful to prepare themselves beforehand and maintained a close check on whether they and the performers were, in fact, talking about the same subject area or task. Some revisions were made in the skill scales and the Knowledge System as the pilot test progressed.

THE FACTOR STRUCTURE OF VARIABLES

The most exciting part of the pilot test was, in one respect, the actual computer work. For several years, while the method was being developed, it could not be fully known whether the factor analysis programs would yield statistically adequate and interpretable results. In addition, there was no way of predicting beforehand what would be learned about the ways in which skills and knowledge variables interrelate in the world of patient care.

As indicated in Chapter 2, the 273 tasks called for 217 variables including the 16 skills and 201 knowledge categories. These were reduced to 16 skills and 128 knowledge categories for purposes of factor analysis.

The simple factoring of variables was very satisfactory. There was no doubt that the six factor solution was the most appropriate. Six factors account for all but three of the variables. The addition of factors such as in a seven or eight factor solution yields no different factor structure; while fewer factors, such as in a five or four factor solution simply loses variables and interesting results.[1]

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[1] The six-factor solution accounts for 73 percent of the variance. (Variance refers to a statistical measure which reflects the different scale values of each of the variables as found in the tasks. The greater the range and distribution for the scales in the task data, the greater the variance.) The fact that the large number of variables are accounted for by a small number of factors with as much as 73 percent of the variance accounted for is considered statistically very satisfactory.

On inspecting the loadings of each variable on each factor it became evident that there are six, almost independent factors when factor loadings of .50 and higher are used to designate each factor. However, since loadings from .41 to .50 still have some influence on the character of a factor and help explain it, loadings of ±.41 or higher will be used in the discussion of the factor structure of variables. As a result of the lower criteria, 51 variables appear on more than one factor.

As Figure 6 indicates, Factor I accounts for 89 of the 144 variables. It also accounts for 33 percent of the variance. The meaning of this factor becomes clearer as the other factors are examined. It turns out that this factor refers to the basic skills and knowledges needed for surgery, diagnosis, prescription and teaching at the professional level.

Figure 6. DISTRIBUTION OF VARIABLES IN FACTORS

	Skills	Know.Categories	Total Variables	Variance
Total in Pilot Test Factoring	16	128	144	73%
Accounted For By Factor At ±.41 or Higher:				
Factor I	5	84	89	33%
Factor II	0	49	49	17%
Factor III	2	7	9	6%
Factor IV	7	8	15	5%
Factor V	3	11	14	6%
Factor VI	0	18	18	6%
Accounted For At ±.41 On More Than One Factor	3	48	51	
Unaccounted For At ±.41 On Any Factor	3	0	3	
Total Accounted For in Analysis	16	201	217	

The fact that there are 89 interrelated variables determining Factor I points up the dramatic fact that in health the professional levels are represented, not only by higher levels of knowledge, but by a very wide variety of essential knowledge. This is the nature of diagnosis, prescription and surgery.

Figure 7 presents the 89 variables for Factor I in descending order of their loadings on the factor. Subjects in Normal Structure and Function, Pathology, Pharmacology, Surgery, First Aid, and many other related fields are represented. Their role in Factor I is, not that they are the only variables to consider when the tasks partaking of this factor structure are identified, but that these variables all tend to be needed if any are needed, and at interrelated levels.

The most important skills for Factor I involve Leadership (delegation of duties and teaching); Taxonomic Skills, clearly related to diagnosis; Figural Skills,most related to surgery; and Implicative Skills, most obviously needed for deciding on what to do next. The interrelationship of the skills and knowledge indicate that these will rise and fall together. They must, therefore,be taught in a similar fashion.

Returning to Figure 6, the reader will note that Factor II also shows the interrelationship of a large number of variables. This factor accounts for 17 percent of the variance and is determined by 49 knowledge category variables. On inspection of these variables in Figure 8, it becomes apparent that this is a factor involving diagnosis, treatment and care of pediatric patients, but may also cover chronic care. It includes the subject areas of Growth and Development and aspects of diagnosis and care in which the Center's emphasis on combining a behavioral orientation with medicine is reflected.

Figure 7 . INTERRELATED VARIABLES DETERMINING FACTOR I
p. 1 of 5

Category Number	Category Name	Factor Loading
12323000	Drug excretion	.92
12322000	Drug distribution	.91
12321000	Drug absorption	.90
12313000	Drug dose-response relationships	.90
13900000	Biochemical processes and mechanisms	.88
11743100	Biochemistry of nutrients	.86
12335000	Drug synergism	.86
11743200	Physiology of nutrients	.85
11731930	Autonomic nervous system	.84
11731920	Peripheral nervous system	.84
12342200	Drugs acting on the blood and immunologic system	.84
11732400	Metabolism	.83
11731640	Liver, biliary system, and pancreas	.83
12333000	Drug resistance (of a non-genetic nature)	.83
12342100	Drugs acting on the cardiovascular system and smooth muscle	.83
11731910	Central nervous system (brain and spinal cord)	.82
12342800	Drugs acting on the nervous system	.81
12341200	Antiprotozoal/antimetazoal chemotherapy	.81
11732300	Homeostasis of fluids	.81

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 7 . INTERRELATED VARIABLES DETERMINING FACTOR I (continued)
p. 2 of 5

Category Number	Category Name	Factor Loading
11735500	Endoscopy	.81
11731610	Mouth, pharynx (digestive function), esophagus	.79
11731620	Stomach and small intestine	.79
11731630	Large intesting (colon) and rectum	.79
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs	.79
12342600	Drugs for allergy, cough, vomiting and the dermato-mucosal surfaces	.79
12342700	Drugs acting on the gastrointestinal tract	.79
12342400	Vitamins and nutritional agents	.79
11735700	Manipulation	.79
11733530	Disorders of the autonomic nervous system	.77
12334000	Drug tolerance and physical dependence	.77
12341100	Antibacterial and antifungal chemotherapy	.77
12331000	Drug toxicity	.76
11731945	The ear (excluding balance function)	.76
12332000	Drug idiosyncrasy and allergy pharmacogenetics	.75
11731943	Eye and optic nerve	.74
11733520	Disorders of the peripheral nervous system	.74
11734800	Shock and trauma	.74
11732210	Endocrine glands and their hormone physiology	.73
11731810	Muscles	.73
11735000	Surgery	.72

Figure 7 . INTERRELATED VARIABLES DETERMINING FACTOR I (continued)
p. 3 of 5

Category Number	Category Name	Factor Loading
11732100	Immunologic system	.72
11731900	Nervous system	.71
11733510	Disorders of the central nervous system	.71
11731831	Skin and sweat glands	.69
11733700	Disorders of the digestive system	.69
11735600	Suture	.69
11733300	Endocrine, nutritional, and metabolic disorders	.68
11734200	Disorders of the musculoskeletal system and connective tissues	.68
11733800	Disorders of the respiratory system	.68
11737200	Hemorrhage and bleeding and their arrest	.68
11743000	Nutrition and dietetics	.68
11731300	Hematopoietic system	.67
11737600	Resuscitation	.67
11734100	Disorders of the skin and subcutaneous tissues	.67
11731600	Digestive system	.66
11735100	Operative procedures	.66
11731820	Bones and joints	.65
11731700	Urinary system and external genitalia	.65
11736000	Anesthesiology	.65
12300000	Pharmacology	.64
11731500	Respiratory system	.63
11732220	Reproduction	.63

Figure 7 . INTERRELATED VARIABLES DETERMINING FACTOR I (continued)
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Category Number	Category Name	Factor Loading
11733200	Neoplasms (cancerous growths)	.63
11733600	Disorders of the circulatory system	.62
11733900	Disorders of the uro-genital system	.61
11731400	Circulatory system	.60
11737000	First aid and care	.60
11737100	Bandages, dressings, tourniquets and splints	.60
11737700	Wounds and their healing	.60
5	Leadership	.59
11732223	Female reproductive system	.58
11733100	Infective and parasitic diseases	.56
13	Taxonomic Skills	.55
11735400	Introductory procedures	.55
12220000	Radiographic (X-ray) analysis	.55
11743400	Nutritional requirements and diets	.54
11731200	Topographic anatomy	.52
11745000	Growth and development	.50
11731100	Regional anatomy	.50
41696000	Psychosomatic disorders	.48
11731000	Normal structure and function	.47
11	Figural Skills	.47
11733000	Pathology	.46
11738000	Asepsis	.46

Figure 7 . INTERRELATED VARIABLES DETERMINING FACTOR I (continued)
p. 5 of 5

Category Number	Category Name	Factor Loading
14	Implicative Skills	.43
41697000	Transient situational disturbances	.43
65620000	Mechanics of writing English	.43
11745100	Embryology and prenatal period	.42
12	Symbolic Skills	.41

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 8 . INTERRELATED VARIABLES DETERMINING FACTOR II
p. 1 of 3

Category Number	Category Name	Factor Loading
11733545	Disorders of the ear	.84
12341400	Local chemotherapy	.82
11733543	Disorders of the eye and optic nerve	.81
11745500	Adolescent growth	.80
41691000	Mental retardation	.78
41692000	Organic brain syndrome	.78
41697000	Transient situational disturbances	.78
11745400	Childhood growth	.77
11734700	Poisoning	.76
11742133	Special post-disease and chronic disease therapy	.76
11744100	Oral hygiene and care	.76
41660000	Development and growth of behavioral processes of the individual	.76
11733400	Disorders of blood and blood-forming organs	.75
11745600	Adulthood	.72
41690000	Psychopathology	.69
11734600	Burns	.68
41696000	Psychosomatic disorders	.68
11732222	Male reproductive system	.67
11742132	Corrective, preventive and compensatory adjustments	.66

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 8 . INTERRELATED VARIABLES DETERMINING FACTOR II (continued)
p. 2 of 3

Category Number	Category Name	Factor Loading
11742100	Physical therapy	.66
11742148	Exercise	.65
11737400	Sprains, strains, fractures and their healing	.64
11741000	Epidemiology	.64
11743300	Nutritional qualities of foods	.64
11745300	Infant growth (second month through second year)	.63
11737500	Foreign bodies not involving wounds	.57
11745700	Old age (geriatrics)	.57
11734300	Congenital abnormalities	.56
11739430	Sanitation	.55
11745200	Neo-natal period	.53
11737300	Handling and transportation of the sick or wounded	.50
41710000	Psychotherapy and counseling	.50
11732100	Immunologic system	.48
11800000	Microbiology	.48
11732221	Conception and contraception	.47
11731300	Hematopoietic system	.46
12342600	Drugs for allergy, cough, vomiting and the dermato-mucosal surfaces	.46
11200000	Genetics	.45
11743400	Nutritional requirements and diets	.45
12342700	Drugs acting on the gastrointestinal tract	.45
11731943	Eye and optic nerve	.44

Figure 8 . INTERRELATED VARIABLES DETERMINING FACTOR II (continued)
p. 3 of 3

Category Number	Category Name	Factor Loading
11734200	Disorders of the musculoskeletal system and connective tissues	.44
12334000	Drug tolerance and physical dependence	.44
12342400	Vitamins and nutritional agents	.44
11731945	The ear (excluding balance function)	.43
12341200	Antiprotozoal/antimetazoal chemotherapy	.43
11733520	Disorders of the peripheral nervous system	.42
12333000	Drug resistance (of a non-genetic nature)	.42
11733700	Disorders of the digestive system	.41

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

The fact that no skills are involved in determining Factor II does not indicate that they are not needed; only that they are not associated with these categories in any regular way.

Again returning to Figure 6, the reader will observe that Factors III, IV, V and VI all explain about six percent of the variance and are determined by 9, 15, 14 and 18 variables, respectively. These factors are easier to understand than Factors I and II. Factors I and II are clearly professional-level factors. The other four factors more obviously reflect groupings from which specially related sequences can be developed.

Factor III quite clearly relates to radiology and radiologic technology. As can be seen from Figure 9, its two skills, Figural and Taxonomic, interrelate with seven knowledge categories that reflect the work with X-rays.

Factor IV is described by Figure 10. This is a factor reflecting Human Interaction, counseling, social service and other behavioral aspects of care. The factor reflects the emphasis at the Center on providing care in a social as well as a medical context. The interrelationship between Human Interaction, Oral Use of Language, Decision Making on Methods and Decision Making on Quality was noted in early tests of the skills. The fact that they are again related suggests a stable association of these skill variables to which the addition of the knowledge categories adds a deeper meaning.

Figure 9 . INTERRELATED VARIABLES DETERMINING FACTOR III

Category Number	Category Name	Factor Loading
15315000	Optical properties	-.91
15214200	Optics	-.89
12210000	Radiobiology	-.84
12200000	Radiology	-.78
15212100	Electric circuit theory	-.72
12220000	Radiographic (X-ray) analysis	-.67
11	Figural Skills	-.55
11731200	Topographic anatomy	-.41
13	Taxonomic Skills	-.41

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 11 presents the variables which determine Factor V. They describe the interrelated knowledges and skills needed for direct physical care of the patient, including Object Manipulation, the two Anatomies, much of First Aid, and Asepsis. It is of interest that Consequences of Error to Humans loads high on this factor. The immediacy of physical treatment raises the immediacy of the dangers involved and emphasizes the need to teach the appropriate skills.

Figure 10. INTERRELATED VARIABLES DETERMINING FACTOR IV

Category Number	Category Name	Factor Loading
41884000	Social service administration and policy	-.74
41885100	Social agencies (public and private) administration and policy	-.58
9	Decision Making on Methods	-.58
41884200	Health services administration and policy	-.56
41710000	Psychotherapy and counseling	-.56
4	Human Interaction	-.55
6	Oral Use of a Relevant Language	-.55
41690000	Psychopathology	-.50
14	Implicative Skills	-.51
10	Decision Making on Quality	-.48
7	Reading Use of a Relevant Language	-.48
8	Written Use of a Relevant Language	-.47
65620000	Mechanics of writing English	-.46
11733000	Pathology	-.43
11739430	Sanitation	-.42

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 11. INTERRELATED VARIABLES DETERMINING FACTOR V

Category Number	Category Name	Factor Loading
11731200	Topographic anatomy	-.58
11738000	Asepsis	-.58
2	Object Manipulation	-.57
16	Consequences of Error To Humans	-.56
11737300	Handling and transportation of the sick or wounded	-.53
11731100	Regional anatomy	-.52
11737200	Hemmorrhage and bleeding and their arrest	-.52
11737100	Bandages, dressings, tourniquets and splints	-.52
11731400	Circulatory system	-.48
11745300	Infant growth (second month through second year)	-.45
11735400	Introductory procedures	-.44
11	Figural Skills	-.44
11745200	Neo-natal period	-.42
11731500	Respiratory system	-.41

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±00 to ±99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

Figure 12 presents Factor VI. This factor is extremely easy to interpret and provides one of the more intellectually satisfying results of the factoring. This is a female care factor, covering sex, conception, contraception, pregnancy, childbirth and gynecological disorders. It is of interest to note that the surgical aspects of obstetrics and gynecology are largely represented in Factors I and V. The absence of skills from the factor suggests that the skill variables do not interrelate systematically with the knowledge variables.

FACTOR STRUCTURE OF TASKS

The "two-mode" factor program was applied to a full set of task data for the first time during the pilot test. The results were extremely gratifying. The six task factors are based on the loadings of the tasks on each of the six factors. Each factor is the expression of its counterpart variable factor. A task's loading on a factor is determined by the degree to which it partakes of the skill and knowledge variables that determined its corresponding variable factor. The interrelationship of the variable factors and the task factors is achieved through the use of the two-mode program.

The two mode solution permits the rank ordering of each task on each factor by its loading on the factor. A task's loading reflects its scale values on the variables involved in the factor and also reflects the number of those variables determining the factor on which the task scales above zero. Thus, the more categories and skills involved in the factor and the higher the task's scale value for these, the higher

Figure 12. INTERRELATED VARIABLES DETERMINING FACTOR VI

Category Number	Category Name	Factor Loading
11735800	Delivery methods for childbirth	-.80
11745100	Embryology and prenatal period	-.70
11734400	Disorders and complications of pregnancy, childbirth, puerperium	-.67
11734500	Perinatal morbidity and mortality	-.63
11732223	Female reproductive system	-.52
11732221	Conception and contraception	-.51
11732222	Male reproductive system	-.48
11733900	Disorders of the uro-genital system	-.48
11800000	Microbiology	-.48
11734300	Congenital abnormalities	-.47
11200000	Genetics	-.47
11732220	Reproduction	-.46
11731700	Urinary system and external genitalia	-.46
11741000	Epidemiology	-.45
11732210	Endocrine glands and their hormone physiology	-.44
11735100	Operative procedures	-.44
11733100	Infective and parasitic diseases	-.43
11733300	Endocrine, nutritional, and metabolic disorders	-.41

Note: Factor loadings represent the degree to which skill and knowledge variables partake of the factor. Loadings are standardized and range from ±.00 to ±.99. Loadings of .41 or higher are shown. These variables tend to rise in an interrelated manner.

the task's loading on the factor. Tasks with no knowledge categories and few skills do not load high on any factor.[2]

Assignment of Tasks to Factors

Rank ordering the tasks for each factor is not enough for assignment of tasks to factors. A task may load high on many factors. The nature of the variable data in health care tasks is such that most higher level tasks include most knowledge categories and most skills, while many variables are represented in more than one factor. Thus, it must be emphasized that the assignment of a task to a factor must primarily reflect its relation to lower-level tasks in terms of the variables which determine the factors.

The method used was to assign a task to the factor on which it loaded highest, with assignment to other factor(s) on which it loaded high if the manifest content of the task and the factor warranted this. At the initial stage of analysis this practice permitted detailed inspection of alternatives. Tasks which loaded low on all factors because they require little or no knowledge or skills were not assigned to factors unless there was a clear association of the context of the task with the content of the factor. For example, preparing for suture was put into the same factor with suturing by virtue of its context.

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[2] By way of contrast, the use of a "factor score" program for rating tasks on the basis of the factor structure of variables proved to result in distortions. Those aspects of the factor structure resulting from chance statistical quirks are greatly magnified, and the procedure leads to bizarre results, especially with tasks having few knowledge categories. The "two-mode" method proved to be far superior.

Since the concept of graduated educational steps lies behind the reason for arranging tasks in hierarchies by factor, it was decided to examine the tasks in each rank order grouping to see if some tasks should not be on one or another factor by virtue of requiring too many skills or knowledge categories unrelated to those required by the other tasks in the factor. The reader will remember that the task's loading on a factor determines its rank order on the factor; but the task can require a good many other skills and knowledge categories beyond those determining the factor.

As a result of this latter inspection, the number of tasks assigned to more than one factor was somewhat reduced, but no major reshuffling was required. The factor structure of tasks has proven to be surprisingly sensitive to the general direction of educational content and level, and produces robust results.

As Figure 13 indicates, the two professional-level factors (Factors One and Two), which account for the largest number of skill and knowledge variables, account for (or are the highest factor for) the fewest number of tasks. Most of the tasks' loadings fall away sharply from these two factors, expressing the vast educational gap between surgery, diagnosis, and prescription tasks, and most other tasks. There were 61 tasks unassigned to factors, and 17 tasks represented on two factors each.

Figure 13. DISTRIBUTION OF TASKS TO FACTORS

	Number	Percent of Total
Total	273	
Factor One	15	5
Factor Two	11	4
Factor Three	26	10
Factor Four	60	22
Factor Five	90	33
Factor Six	27	10
Unassigned	61	22
On More Than One Factor	17	6

The factor with the largest number of tasks was Factor Five, the Physical Treatment and Care Factor, followed by Factor Four, the Human Interaction, Social Service and Counseling Factor.

Assignment of Tasks to Levels by Factor

Although the factor loadings for the tasks permitted easy assignment of tasks to factors, the meaning of a difference of loading of, for example, .83 and .44 was hard to judge in educational terms. A task's loading at .83, when contrasted with a task loading of .44, means more categories related to the factor for the task, or higher scale values for the categories, or a combination of these. In addition, the weight of a variable on the factor (the variables own loading on the variable factor) also influences a task's factor loadings.

Since the objective was to identify rungs on a ladder, stages in a sequence, or comparable levels for tasks -- all of these being interchangable concepts -- it was necessary to do one further type of analysis. The tasks of a factor were laid out in rank order of their loadings on the factor, and the skills and knowledges were laid out in the order of their appearance in tasks, from low to high on the factor. This permitted identification of the major cut-off points when marked increases in scale level occurred or when large blocks of new knowledge categories were needed. This information was used to determine which tasks within a factor were at relatively the same level. Finally, by using the tasks which appear in more than one factor as an added guide, it was possible to relate the task level groupings across factors.

Seven levels were identified; but each factor did not necessarily have tasks at each level. (Within Factor Four, the third level is divided into two parts on the basis of the content of the tasks involved.) Figure 14 indicates the distribution of tasks by level.

Figure 14. DISTRIBUTION OF TASKS BY LEVEL

	Number	Percent of Total
Total	273	
Level 7	4	1
Level 6	22	8
Level 5	23	8
Level 4	28	10
Level 3	55	20
Level 2	74	27
Level 1	72	26
On More Than One Level	7	3

A task could be on one level for one factor and on another level for another by virtue of what it had in common with the other tasks in a level.

Tasks which appear in Factors Five and Six appear at the same level in each. Tasks which appear in Factors Four and Five tend to be at a lower level in Four. This reflects the fact that Factor Four is determined more by skill interrelationships than by knowledge interrelationships.

As can be expected, the tasks decrease in number as the levels rise. The shape of the distribution is not unlike the distribution of jobs in the industry as a whole. (The major difference is that the levels of the jobs do not necessarily correspond to the levels of the tasks.)

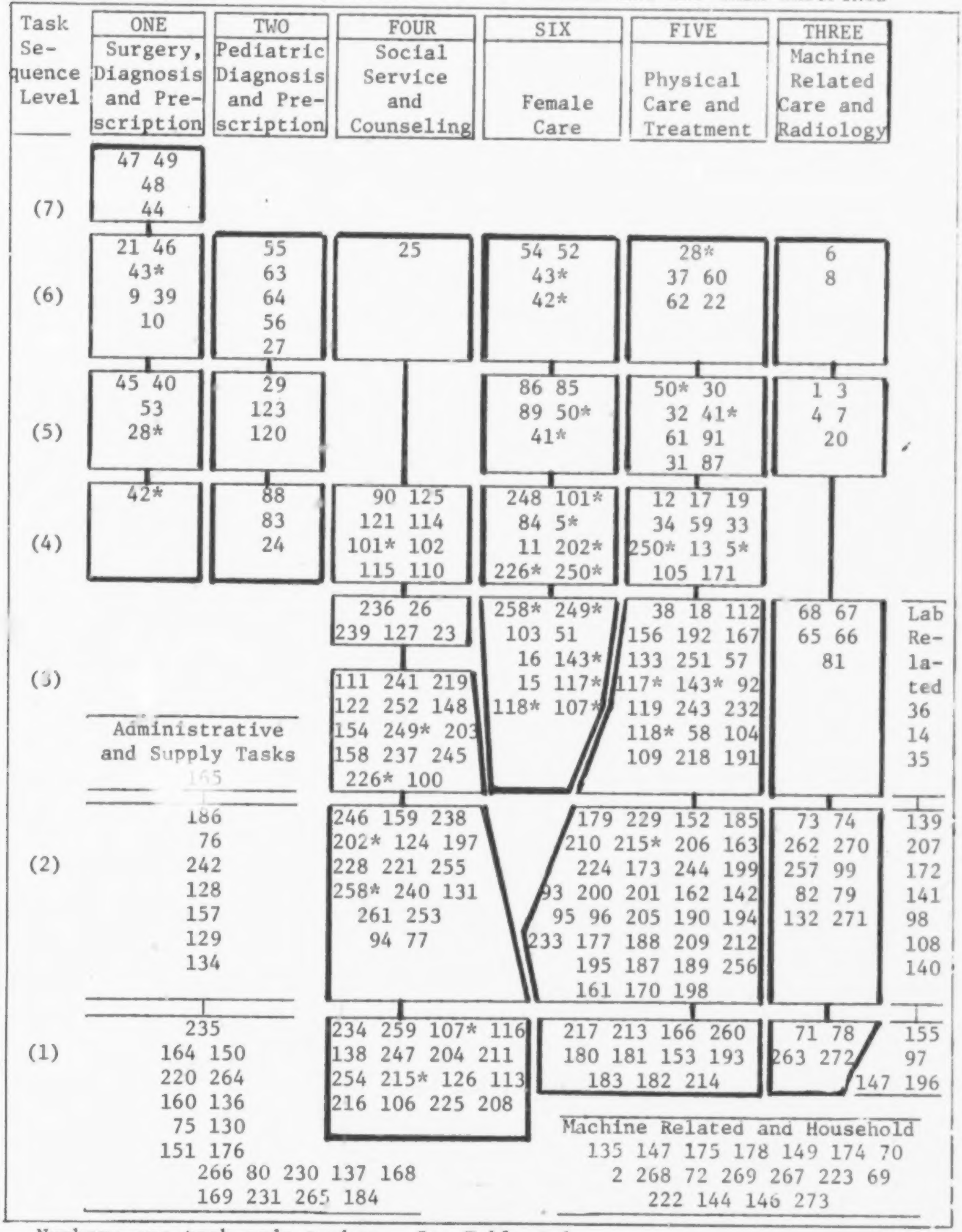
The reader who wishes to identify the levels in academic or occupational terms might consider the following possible characterizations for the seven levels:

Level 1	Aide; entry; unskilled; on-the-job-training.
Level 2	Assistant; semi skilled; on-the-job-training with credit.
Level 3	Technician; some special training; about one year.
Level 4	Semi-Professional; two or more years of training.
Level 5	Professional I; professional training.
Level 6	Professional II; highly rigorous and/or specialized professional training.
Level 7	Surgery or its equivalent in post professional training.

The Task Sequences

Figure 15 presents the tasks by code number within levels and by factor. It is a visual portrayal of the results of the factor analysis. The six factors are represented as task sequences rather than job ladders because the nature of the factors are such that, ideally, whole jobs would

Figure 15. TASK SEQUENCES BY FACTOR ASSIGNMENT AND TASK GROUPINGS



Task Sequence Level	Administrative and Supply Tasks	ONE Surgery, Diagnosis and Prescription	TWO Pediatric Diagnosis and Prescription	FOUR Social Service and Counseling	SIX Female Care	FIVE Physical Care and Treatment	THREE Machine Related Care and Radiology	Lab Related
(7)		47 49 48 44						
(6)		21 46 43* 9 39 10	55 63 64 56 27	25	54 52 43* 42*	28* 37 60 62 22	6 8	
(5)		45 40 53 28*	29 123 120		86 85 89 50* 41*	50* 30 32 41* 61 91 31 87	1 3 4 7 20	
(4)		42*	88 83 24	90 125 121 114 101* 102 115 110	248 101* 84 5* 11 202* 226* 250*	12 17 19 34 59 33 250* 13 5* 105 171		
(3)	165			236 26 239 127 23 111 241 219 122 252 148 154 249* 203 158 237 245 226* 100	258* 249* 103 51 16 143* 15 117* 118* 107*	38 18 112 156 192 167 133 251 57 117* 143* 92 119 243 232 118* 58 104 109 218 191	68 67 65 66 81	36 14 35
(2)	186 76 242 128 157 129 134			246 159 238 202* 124 197 228 221 255 258* 240 131 261 253 94 77	179 229 152 185 210 215* 206 163 224 173 244 199 93 200 201 162 142 95 96 205 190 194 233 177 188 209 212 195 187 189 256 161 170 198		73 74 262 270 257 99 82 79 132 271	139 207 172 141 98 108 140
(1)	235 164 150 220 264 160 136 75 130 151 176 266 80 230 137 168 169 231 265 184			234 259 107* 116 138 247 204 211 254 215* 126 113 216 106 225 208	217 213 166 260 180 181 153 193 183 182 214		71 78 263 272	155 97 147 196

Machine Related and Household

135 147 175 178 149 174 70 2 268 72 269 267 223 69 222 144 146 273

Numbers are task code number. See Table A.1.

* Asterisk indicates that task also appears on another factor.

probably be made up of combinations of one or more sequences rather than a single factor or the task contents would be edited or expanded.

The reader will note that tasks appearing on more than one factor appear with asterisks. (They later become the basis for lattice relationships.) Tasks which were not assigned to factors have been grouped in terms of their skill and knowledge requirements and function. They provide entry level sources for the sequences and/or the rudiments for other factors to be expected when the data base is expanded to include more job titles, such as in the laboratory or in administration.

The task content of the sequences are presented in Figures 16 through 22,which follow. Each Figure presents the tasks of one of the task factors. On the left is the task's code number and the task's abbreviated name. (The full name can be found in Appendix Table A.1.) Next to the name appears the title in which the task is located. If it is an overlap task, more than one title appears. Next to each title is the scale value on the Task Frequency Scale which indicates how often the performer does the task. Appendix B.3 presents the Task Frequency Scale. The last column on the right presents the task's loading on the factor. The reader will note that the tasks are listed in descending order of their loadings. At various intervals within the Figure there is a horizontal line. These lines separate task levels, so that all the tasks between such lines are grouped into the same level.

Figure 16 is the Factor One Task Hierarchy. At the top of the Figure are the Obstetrician-Gynecologist's surgical tasks. Included in

Figure 16. FACTOR ONE TASK HIERARCHY: SURGERY, DIAGNOSIS AND PRESCRIPTION SPECIALTY

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
47	Surgical excision of uterus, ovaries: hysterectomy through abdomen or vagina.	OB-GYN	4	1.78
49	Ligation of fallopian tubes.	OB-GYN	4	1.78
48	Vaginal plastic surgery or correction of vaginal hernia.	OB-GYN	3	1.78
44	Cesarean section delivery.	OB-GYN	3	1.67
21	Informally instructing interns, residents in patient care.	INT	4	1.62
46	Saline abortion.	OB-GYN	2	1.59
43	Delivery of baby through vagina.	OB-GYN	3	1.54
9	Diagnosing medical condition and deciding care for non-child patient.	INT	7	1.53
39	Diagnosing obs-gyn condition and deciding care for female patient.	OB-GYN	8	1.51
10	Deciding whether to proceed with care and administer medication to non-child patient.	INT	7	1.44
45	Currettage abortion.	OB-GYN	4	1.39
40	Deciding whether to administer or change medication for female patient.	OB-GYN	6	1.35
53	Instructing nurses in obs-gyn patient care.	OB-GYN	7	1.05
28	Emergency life support care.	INT PED	1 2	.79
42	Providing fertility assistance for female pt.	OB-GYN	4	.77

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized, and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign, as continuous hierarchy.

this factor are the diagnosis and prescription tasks for Obs-Gyn and for the Internist, and the reconsidering and administration of medication for both physicians. Teaching tasks which draw on similar knowledge are also included. The bottom of the sequence is a fertility assistance task. Its appearance here is better understood if it is remembered that the task includes andrometric biopsy (part of surgical procedures) and pharmacological prescription when either is appropriate.

With the identity of the tasks known, the reason for the large number of variables for this factor is apparent. These tasks represent a sequence of professional level tasks, all of which draw on a vast quantity of knowledge at fairly high levels. The reason that none of the other factors lead into this one is due to the sheer magnitude of the increase in knowledge categories and the rise in scale levels.

Figure 17 presents the Factor Two tasks. At the top of this sequence is the diagnostic task in pediatrics and related teaching. The entry to this factor is through the Nurse Practitioner's junior version of diagnosis (for adults as well as for juveniles). It is apparent that the variable factor drew on the need for subjects in Growth and Development for these tasks. The factor differs from Factor One in this respect; it also differs because it does not involve subjects directly related to surgery or obstetrics.

The Factor Three task hierarchy (Figure 18) provides the first interesting surprise. It seems that there are tasks outside the usual scope of X-ray that are related to the factor. These tasks include those

Figure 17. FACTOR TWO TASK HIERARCHY: PEDIATRIC SPECIALTY IN DIAGNOSIS AND PRESCRIPTION

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
55	Diagnosing health and development and deciding care for pediatric patient.	PED	8	1.65
63	Lectures, tests for Nurse Practitioners; delegation of duties considered.	PED	3	1.60
64	Informally training Nurse Practioners; delegation of duties considered.	PED	4	1.49
56	Deciding whether to go ahead with pediatric care and administer medication.	PED	6	1.43
27	Lectures to staff and students on health and medical subjects.	INT OB-GYN	2 2	1.22
29	Informally instructing subordinates in patient care.	INT PED	4 3	1.16
123	Instructing Family Health Workers or Nurse-interns in patient care.	NP	44	.90
120	Preparing, presenting classes for Family Health Workers; evaluating students.	NP	2	.84
88	Identifying juvenile's health condition.	NP	7	.59
83	Identifying obvious medical condition of adult and follow-up on care.	NP	4	.44
24	Assessing urgency of follow up for no-show patients.	INT OB-GYN PED	6 6 7	.34

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[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN: Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

Figure 18.

FACTOR THREE TASK HIERARCHY: SPECIALTY IN MACHINE RELATED CARE AND RADIOLOGY

p. 1 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
6	Reading, assessing X-rays and making recommendations.	RAD	8	-1.12
8	Answering MD questions about radiographs.	RAD	3	-1.06
1	Fluoroscopy of lower intestinal tract.	RAD	6	-.86
3	Fluoroscopy of upper GI tract.	RAD	6	-.86
4	Fluoroscopy portion of hysterosalpyngography.	RAD	3	-.85
7	Assessing performance and output of X-ray workers.	RAD	4	-.76
20	Reading and interpreting "stat" X-rays on request.	INT PED	4 6	-.42
68	Preparing patient and barium drink for fluoroscopy and taking upper GI X-rays.	X-ray	6	-.38
67	Taking lower GI series X-rays and scout film.	X-ray	6	-.38
65	Taking X-rays with vertical or table X-ray machine.	X-ray	8	-.37
66	Taking IVP X-rays after allergy test.	X-ray	4	-.36

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

Figure 18. FACTOR THREE TASK HIERARCHY (continued)
p. 2 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
81	Assessing quality of radiographs.	X-ray	8	-.28
73	Reassuring patient about X-ray procedures.	X-ray	9	.02
74	Re-explaining pre-X-ray home procedures to pt.	X-ray	6	.02
262	Preparing patient and taking electrocardiogram.	EKG	8	.05
270	Demonstrating and instructing on taking EKG.	EKG	2	.05
257	Giving vision screening tests (Keystone and Snellin).	MA-U	6	.05
99	Administering Snellin eye test.	NP	2	.07
82	Calling repair company re X-ray equipment.	X-ray	6	.07
79	Preparing barium enema.	X-ray	6	.07
132	Checking and caring for equipment.	LPN-U LPN-E	4 4	.07
271	Deciding if EKG reading looks suspicious.	EKG	6	.07
71	Developing radiographs using hand developer.	X-ray DRA	3	.08
78	Preparing radiograph packet for interpretation.	X-ray	9	.08
263	Cutting and mounting an EKG strip.	EKG	8	.09
272	Checking level of developer and fixer solution.	DRA	6	.09

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized, and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign, as continuous hierarchy.

involved in EKG and eye tests. What is involved are the Figural Skills, Object Manipulation and knowledge such as Topographic Anatomy and Handling and Transporation of the Sick or Wounded. Moreover, these tasks are on the factor because the variables which determine the factor are required in a manner more compatible with the interrelationships among variables on this factor than on others.

An additional point of interest about this factor is that there are obvious gaps in the sequences. The tasks in X-ray performed at the Center do not warrant placement above Level 3. The Radiologist's tasks first appear at Level 5. Thus, there is the suggestion that the task sequence must carry the performer out of the Center and into the hospital for any real upgrading to be possible. The curriculum implication of this is discussed later in this document.

Figure 19 presents the tasks of the Social Service and Counseling Factor. This factor is loaded down by the institutional tasks of attending conferences and participating on committees because of the Human Interaction and related skills involved. Discounting these tasks, one has a factor which addresses itself to counseling and teaching the patient, providing social services, dealing with social problems and, in a rudimentary way, giving some psychological services. The factor is probably truncated. The functions of the social worker, psychologist or psychiatrist were not covered in the pilot test. However, the factor does emphasize the counseling aspects of some of the patient care tasks of the Nurse Practitioner and the Family Health Worker in cases where the abbre-

Figure 19.

FACTOR FOUR TASK HIERARCHY: SOCIAL SERVICE AND COUNSELING SPECIALTY

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
25	Participating in Family Health conference as internist.	INT	4	-.51
90	Post-hospital visit to chronic schizophrenic patient.	NP	4	-.47
125	RN committee work on health procedures.	NP	3	-.46
121	Participating in Family Health Team conference as Nurse Practitioner.	NP	4	-.45
114	Pragmatic counseling for patient on personal problems.	NP	4	-.43
101	Counseling in sex, contracept., VD, abortion.	NP	6	-.41
102	Chronic or special care procedures for daily living reinforced or explained to patient.	NP	4	-.41
115	Deciding on and arranging referral of patient to agency.	NP FHW	6 9	-.32
110	Answering patient's questions on care at RN level.	NP	8	-.31
236	Discussing personal, social, health problems with patient.	FHW	4	-.30

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = S-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining factor for placement here.

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 2 of 5

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
26	Participating in committees at institution.	INT PED	2 6	-.27
239	Participating in Family Health Team conference as Family Health Worker.	FHW	4	-.22
127	Work schedules planned and approved re pts.	MP	6	-.22
23	Filling in forms and letters describing patient's medical condition for institutions.	INT OB-GYN PED	6 6 7	-.19
111	Safety inspection of patient's home.	NP	3	-.18
241	Providing job orientation to new co-worker Family Health Worker.	FHW	2	-.16
219	Accompanying patient to any social agency.	FHW	3	-.14
122	Coordinating multi-agency exams for patient.	NP	4	-.11
252	Conducting routine exam of chronic disease pt.	FHW	4	-.11
148	Answering patients' phone questions at LPN capability.	LPN-U	3	-.10
154	Participating in Unit conference as LPN.	LPN-U	3	-.10
249	Conducting routine post partum exam.	FHW	3	-.08
203	Reinforcing diet and making ethnic substitutes.	LPN-U FHW	3 6	-.07
158	Informally evaluating and teaching subordinate Med. Assts.	LPN-U	6	-.06
237	Discussing consumer protection and helping patient with budgeting.	FHW	4	-.06
245	Orienting and taking intake information from new family.	FHW	4	-.06

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 3 of 5

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
226	Giving basic sex education, contraception and abortion information.	FHW	4	-.03
[d]100	Giving Denver Development test for child.	NP	4	-.03
246	Reviewing intake information on family, assessing priority of problems.	FHW	4	-.03
159	Following up on no-show patient and arranging new appointment.	LPN-U	3	-.02
238	Deciding patient needs homemaking services and doing.	FHW	4	-.01
[d]202	Giving introductory information on birth control devices, on orders.	LPN-U	6	-.01
124	Checking and assessing subordinates' attendance.	NP	6	-.00
197	Reinforcing prescribed diet and medication.	LPN-E	6	.00
228	Teaching TB patient and family proper health practices.	FHW	3	.00
221	Making oral presentation on good health practices to community people.	FHW	1	.00
255	Contributing opinion at Unit conference as Medical Assistant.	MA-U	4	.01
[d]258	Reinforcing patient in use of contraceptive.	MA-U	6	.02
240	Deciding and arranging appointment for patient at Center.	FHW	6	.03
131	Assigning staff to treatment rooms.	LPN-U LPN-E	6 6	.03
261	Answering telephone in Unit and taking message.	MA-U	4	.03
253	Following up on patient discharged from hospital.	FHW	3	.03

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 4 of 5

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
94	Assessing tine test after time lapse and following up on results.	NP	3	.04
77	Monitoring functions and work of X-ray dept.	X-ray	8	.04
234	Delivering medicine to patient and explaining how to take as ordered.	FHW	4	.04
259	Taking partial history from patient.	MA-U	6	.04
107	Teaching patient self exam and care of breasts.	NP	6	.05
116	Deciding whether to provide patient with transportation.	NP FHW	3 8	.05
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U MA-U	8 8	.05
247	Deciding whether family that moved stays with Family Health Team.	FHW	6	.06
204	Providing orientation tour of facilities and procedures at Center.	LPN-U FHW	2 2	.06
211	Teaching how to bathe and diaper infant.	FHW	3	.06
254	Planning a weekly work schedule for aproval.	FHW	6	.06
[d]215	Teaching how to prepare infant formula.	FHW	3	.06
126	Aproving or changing requisition forms of subordinates.	NP	4	.07
113	Giving general reassurance to any patient.	NP LPN-U LPN-E FHW MA-U	8 8 9 8 8	.07
216	Teaching bottle feeding and burping to new mother.	FHW	3	.07

Figure 19. FACTOR FOUR TASK HIERARCHY (continued)
p. 5 of 5

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
106	Teaching patient postural drainage technique.	NP	1	.07
225	Checking patient's medicines and having old ones discarded.	FHW	3	.07
208	Collecting stool specimen and taking to lab.	FHW	2	.07

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[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining factor for placement here.

viated name does not make this obvious. Sensitivity to others' needs and conditions is an overriding requirement for most of the tasks.

It is worth noting that the LPN and Medical Assistant also have tasks appearing on this factor. It is also interesting that monitoring or semi-supervisory tasks such as 127, 131, 77 and 254 are involved in this factor. The knowledge needed for the tasks being supervised were not as needed as the skills required for the interactions of supervision.

Figure 20 contains the 90 tasks of Factor Five. This factor contains many of the traditional nursing tasks, but indicates that the skills and knowledge required for injections, colostomy care, catheterization and bandaging are carried through to higher levels in suturing, doing bone marrow punctures, spinal taps and, finally, in emergency life support care. The factor focuses attention on the extent to which this factor, which is essentially a treatment factor, relates to Factors One and Two which are diagnosis and prescription factors. The emphasis in Factor Five is on the "laying on of hands," of handling emergencies, injuries and in carrying out prescribed care.

There are a great variety of tasks at each level. The factor suggests the possibility that a patient might benefit more from having taps, punctures and injections done by specialized persons who have constant practice in the skills (provided they are properly educated) than from having these done by physicians who may have little of such practice -- provided the prescription and decision "to do" stays with the physician.

Figure 20.

FACTOR FIVE TASK HIERARCHY:
PHYSICAL CARE AND TREATMENT SPECIALTY
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
[d]28	Emergency life support care.	INT PED	1 2	-.73
37	Treatment of injuries.	INT PED	1 6	-.56
60	Spinal tap from pediatric patient.	PED	4	-.54
62	Bone marrow sample from pediatric patient.	PED	1	-.48
22	Responding to cardiac arrest call; providing care.	INT	1	-.44
50	Taking sample of amniotic fluid from pregnant patient.	OB-GYN	4	-.44
30	Spinal tap from adult patient.	INT	1	-.41
32	Suturing lacerations.	INT PED	1 6	-.39
41	Cauterize; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	3	-.32
61	Drawing blood from pediatric patient's vein.	PED	6	-.31
91	Administering first aid in emergency.	NP FHW	2 2	-.30
31	Bone marrow specimen from adult patient.	INT	2	-.30

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner - NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized, and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign, as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining factor for placement here.

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
p. 2 of 6

Task Code No.	Abbreviated Name of Task	Current Titles^a	Frequency^b	Loading on Factor^c
87	Evaluating or following routine prescribed treatment or care.	NP	8	-.30
12	Removing a wart from non-child patient.	INT	2	-.26
17	Determining if suspect EKG reading is true or artifact.	INT PED	3 6	-.24
19	Determining allergy to dye for IVP X-rays.	INT	6	-.23
34	Incising and draining abcess or boil.	INT PED	1 4	-.22
59	Removing large blunt object from pharynx.	PED	1	-.19
33	Removing sutures.	INT OB-GYN PED	2 3 3	-.16
250	Conducting routine neonate examination.	FHW	3	-.13
13	Setting up and teaching IV apparatus for non-child patient.	INT	2	-.13
5	Instillation portion of hysterosalpyngography.	RAD	3	-.12
105	Irrigating,dressing, bandaging wound or burn as appropriate.	NP	4	-.10
171	Assessing urgency of need for MD to see emergency patient.	LPN-E	7	-.09
38	Removing foreign object from eye and/or ear.	INT	2	-.09
18	Drawing blood from non-child patient's vein.	INT NP	1 2	-.08
112	Teaching diabetic medication or insulin injection.	NP	3	-.06
156	Cleaning, dressing, bandaging wounds as ordered.	LPN-U LPN-E	4 6	-.06
192	Assisting in emergency by preparing materials.	LPN-E	6	-.05

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
p. 3 of 6

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
167	Preparing and administering subcutaneous or intramuscular injections on orders.	LPN-E	8	-.05
133	Preparing, administering, explaining subcutaneous or intramuscular injection as ordered.	LPN-U	8	-.04
251	Conducting routine exam of any patient over six months of age.	FHW	4	-.03
57	Removing foreign object from patient's ear.	PED	3	-.03
117	Irrigating and changing indwelling catheter.	NP	4	-.02
143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	2 1	-.02
92	Removing thread stitches if appropriate.	NP	2	-.01
119	Teaching infant's formula, feeding, bathing, diapering.	NP	3	-.00
243	Taking and recording vital signs; notifying MD of abnormalities.	FHW	4	.00
232	Helping any patient needing assistance in walking.	FHW	3	.00
118	Teaching patient irrigation of catheter.	NP	3	.01
58	Preparing patient with foreign body in eye by applying dye strip.	PED	3	.01
104	Administering common range of motion exercise on orders.	NP	2	.01
109	Teaching irrigation, change, care of colostomy.	NP	1	.01
218	Bandaging or changing bandage for minor wound as ordered.	FHW MA-U	3 4	.02
191	Applying splint on orders.	LPN-E	6	.03
179	Preparing intravenous bottle.	LPN-E	6	.03

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
229	Changing colostomy bag, irrigating on orders.	FHW	1	.03
152	Administering prepacked smallpox vaccine on orders.	LPN-U LPN-E	8 2	.03
185	Assisting in administration of oxygen on orders.	LPN-E	6	.03
210	Bathing any adult bedridden patient.	FHW	3	.04
215	Teaching how to prepare infant formula.	FHW	3	.04
206	Examining, treating bedridden patient for bed sores.	FHW	4	.05
163	Preparing materials for special procedures.	LPN-U	2	.05
224	Deciding to make an occupied bed and making.	FHW	3	.05
173	Preparing patient for suturing.	LPN-E	8	.05
244	Teaching temperature taking and care of thermometer.	FHW	4	.05
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U LPN-E MA-U	8 8 3	.06
93	Applying prepackaged tine test for TB.	NP LPN-U LPN-E FHW MA-U	6 8 7 3 7	.06
200	Applying hot or cold compress on Dr.'s orders.	LPN-U FHW	2 3	.06
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U MA-U	2 4	.06
162	Irrigating ear with solution as ordered.	LPN-U LPN-E MA-U	3 6 1	.06
142	Administering rectal medication as ordered.	LPN-U LPN-E	4 6	.07

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
95	Tablet or dipstick urine test.	NP	4	.07
		LPN-U	3	
		LPN-E	6	
		FHW	4	
		MA-U	6	
96	Taking throat culture specimen; labeling.	NP	4	.07
		LPN-U	4	
		LPN-E	7	
		FHW	2	
		MA-U	6	
205	Giving patient enema on doctor's orders.	FHW	2	.07
190	Assisting patient to or from wheelchair.	LPN-E	6	.07
		FHW	4	
194	Administering eye or ear drops on orders.	LPN-E	2	.07
233	Teaching pt. how to irrigate eye with water.	FHW	1	.07
177	Treating patient for ringworm on Dr.'s orders.	LPN-E	1	.07
188	Applying cold towels or ice bath to patient for fever on orders.	LPN-E	4	.07
209	Giving alcohol bath for fever; reporting if no effect.	FHW	3	.08
212	Assisting any non-infant patient to bathe or shower.	FHW	3	.08
195	Applying eye patch on orders.	LPN-E	6	.08
187	Giving oral medication to patient.	LPN-E	7	.08
189	Treating patient for lice on orders by shampooing.	LPN-E	2	.08
256	Administering prepacked polio vaccine on orders.	MA-U	6	.08
161	Weighing and measuring patient and recording.	LPN-U	8	.09
		LPN-E	6	
		MA-U	8	
170	Assisting patient in dressing.	LPN-E	8	.09

Figure 20. FACTOR FIVE TASK HIERARCHY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
198	Administering oral medication and explaining effects on Dr.'s orders.	LPN-U	4	.09
217	Preparing food, feeding non-infant patient.	FHW	2	.09
213	Treating baby for cradle cap.	FHW	2	.10
166	Assembling suture materials as ordered.	LPN-E	6	.10
260	Preparing hypodermic on orders.	MA-U	4	.10
180	Preparing tray for drawing blood; writing labels.	LPN-E	6	.10
181	Preparing tray for nasal packing.	LPN-E	6	.10
153	Assisting Dr. in medical exam with materials.	LPN-U MA-U	3 7	.10
193	Preparing for bone marrow puncture on orders.	LPN-E	1	.10
183	Inducing vomiting in patient on Dr.'s orders with medication.	LPN-E	2	.10
182	Preparing patient for gastric lavage and assisting.	LPN-E	1	.10
214	Shampooing patient with itchy scalp.	FHW	3	.10

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[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized, and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign, as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining this factor for placement here.

It should also be noted that task 5, instillation of a radiopague dye into the cavity of the female reproductive organs,need not be done by a radiologist as is now the case.

Figure 21 is the Factor Six Specialty in Female Care. It seems to bring together tasks which are found in Factors Four and Five, and reflects their skills and knowledges. The sequence of tasks begins at Level 3, and is therefore able to provide an opportunity to specialize for persons in the other factors at lower levels or at the same level.

It is interesting to note that the neonate examination falls on this factor rather than on Factor Two, and that the instillation task currently done by the Radiologist also appears here (at Level 4).

The reason that task 43 (normal delivery) appears at a high level on this factor is because this task includes the response to emergencies such as a need to change to Caeserian section. Were this a nurse-midwife task, for example, it would probably appear at Level 5.

Figure 22 presents the groupings of tasks which were not assigned to factors. The first set was grouped together because all the tasks seem to deal with laboratory or chemical procedures and appear to be the basis for a laboratory factor were such titles included in the pilot test. These tasks might be joined by tasks 15, 16, and 51 which now appear on Factor Six by virtue of the female-related knowledge involved. Tasks 36, 14 and 35 require some technical training; the other tasks of the group require little special training.

Figure 21.

FACTOR SIX TASK HIERARCHY: SPECIALTY IN FEMALE CARE

p. 1 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
54	Participating in Ob-gyn physician conference.	OB-GYN	4	-1.01
52	Contributing to Family Health Team as Ob-gyn.	OB-GYN	2	-.99
[d]43	Delivery of baby through vagina.	OB-GYN	3	-.62
[d]42	Providing fertility assistance for female pt.	OB-GYN	4	-.57
86	Prenatal exam of pregnant patient; reporting abnormalities.	NP	6	-.47
85	Providing post-partum exam; evaluating condition.	NP	3	-.41
89	Assessing condition of neonate and follow-up.	NP	4	-.35
[d]50	Taking sample of amniotic fluid from pregnant patient.	OB-GYN	4	-.31
[d]41	Cauterize; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	3	-.29
248	Conducting routine prenatal exam.	FHW	4	-.14
[d]101	Counseling in sex, contraception, VD, abortion.	NP	6	-.14

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

[c] Loadings represent the degree to which task partakes of factor. Loadings are not standardized,and sign has no intrinsic meaning except for change from high on one, passing through zero, to opposite sign,as continuous hierarchy.

[d] Task actually loads higher on another factor. Consider variables determining this factor for placement here.

Figure 21. FACTOR SIX TASK HIERARCHY (continued)
p. 2 of 2

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]	Loading on Factor[c]
84	Performing pelvic exam on adult female including specimens and follow-up.	NP	6	-.08
[d]5	Instillation portion of hysterosalpyngography.	RAD	3	-.08
11	Performing routine pelvic exam on adult female patient.	INT	4	-.07
202	Giving intro. information on birth control devices on orders.	LPN-U	6	-.03
226	Giving basic sex education, contraception and abortion information.	FHW	4	-.03
[d]250	Conducting routine neonate examination.	FHW	3	-.03
258	Reinforcing patient in use of contraceptive.	MA-U	6	.00
[d]249	Conducting routine post-partum exam.	FHW	3	.01
103	Measuring, fitting diaphragm for female patient.	NP	3	.02
51	Determining presence of monilia fungi on slide.	OB-GYN	6	.03
16	Examining a slide for gonococci.	INT PED	2 2	.03
[d]143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	2 1	.04
15	Determining presence of trichomonas on slide.	INT OB-GYN PED	2 3 3	.04
[d]117	Irrigating and changing indwelling catheter.	NP	4	.04
[d]118	Teaching patient irrigation of catheter.	NP	3	.04
[d]107	Teaching patient self exam and care of breasts.	NP	6	.06

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	14 LABORATORY RELATED TASKS		
36	Examining blood slide.	INT	2
		PED	6
14	Evaluating a skin specimen slide for fungi.	INT	2
		PED	4
35	Examining spun-down urine sediment and supernate.	INT	3
		PED	4
139	Assessing results of tine test.	LPN-U	8
		LPN-E	7
		FHW	3
		MA-U	7
207	Testing plaster in home for lead; and reporting positive finding.	FHW	3
172	Taking stool specimen and testing for blood.	LPN-E	6
141	Testing stool specimen for blood using tablet.	LPN-U	1
		MA-U	6
98	Obtaining clean catch urine specimen.	NP	4
		LPN-U	7
		LPN-E	7
		MA-U	6
108	Teaching patient reagent or dipstick urine test.	NP	2
140	Teaching how to do urine test using tablet.	LPN-U	3
		MA-U	6
155	Obtaining urine specimen; preparing for lab.	LPN-U	7
		MA-U	8
97	Teaching or collecting specimen for pinworm test.	NP	2
		FHW	2
147	Preparing patient for pelvic exam; preparing slides.	LPN-U	8
		LPN-E	7
		MA-U	6
196	Giving patient enema kit and instructions for use.	LPN-E	6

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[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
p. 2 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	9 ADMINISTRATIVE TASKS		
165	Monitoring subordinates' attendance and reporting excesses.	LPN-U	1
186	Explaining work area to new worker.	LPN-E	4
242	Discussing job description accuracy.	FHW	4
157	Checking chart for entry of lab results.	LPN-U	8
		MA-U	8
134	Tallying information on services provided.	LPN-U	4
164	Filling out forms with ID information.	LPN-U	4
		MA-U	7
220	Calling person to phone or writing message.	FHW	8
160	Escorting patient within institution.	MA-U	6
75	Translating Spanish-English conversation.	X-ray	7
		LPN-U	7
		FHW	7
		MA-U	7
	19 INVENTORY AND SUPPLY RELATED TASKS		
76	Collecting information about and ordering supplies.	X-ray	4
128	Deciding order for non-medicinal supplies.	LPN-U	4
		LPN-E	4
		EKG	2
129	Deciding order for non-narcotic supplies.	LPN-U	6
		LPN-E	4
235	Judging what supplies are needed and requesting.	FHW	8
		DRA	4
150	Checking medications for expiration dates.	LPN-U	3
		LPN-E	3
264	Ordering duplicate copies of forms	EKG	6
136	Checking and storing delivered supplies.	LPN-U	4
		LPN-E	4
130	Obtaining pharmaceuticals as ordered and storing.	LPN-U	6
151	Preparing treatment room by cleaning up and stocking supplies.	LPN-U	4
		MA-U	6
176	Removing sterilized equipment from autoclave; storing.	LPN-E	9
266	Placing and arranging non-drug supplies.	EKG	3
80	Preparing materials for IVP-dye allergy test.	X-ray	4
230	Preparing materials for use in a catheter irrigation.	FHW	2
137	Delivering cultures and specimens to incubator or lab.	LPN-U	4
		MA-U	7
168	Taking throat cultures to Dr. from incubator, for assessment.	LPN-E	4
169	Collecting Dr.'s assessments of throat cultures.	LPN-E	6

Figure 22. TASK GROUPINGS UNASSIGNED TO FACTORS (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Frequency[b]
	19 INVENTORY AND SUPPLY RELATED TASKS (continued)		
231	Delivering and/or picking up forms and supplies.	FHW	3
		EKG	
265	Filing or pulling records of patient.	EKG	4
184	Locking-unlocking narcotic supplies.	LPN-E	6
	18 MACHINE RELATED AND HOUSEKEEPING TASKS		
135	Readying treatment room by wiping up and cleaning.	LPN-U	8
		LPN-E	7
		MA-U	8
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	4
		MA-U	6
175	Preparing equipment for autoclave by wrapping.	LPN-E	6
178	Wrapping sterile equipment removed from sterilizer.	LPN-E	7
149	Sterilizing equipment in hot water sterilizer.	LPN-U	6
		MA-U	6
174	Washing and placing equipment in sterilizer.	LPN-E	8
70	Preparing hand developing tank for X-ray film.	X-ray	3
		DRA	4
2	Loading or unloading film in fluoroscopy machine.	RAD	4
268	Checking EKG paper and putting in new roll.	EKG	6
72	Loading X-ray film cassettes.	X-ray	9
		DRA	9
269	Deciding repair is needed for EKG machine.	EKG	2
		DRA	3
267	Routine cleaning and dusting of machines.	EKG	6
		DRA	6
223	Deciding to make an empty bed and making.	FHW	2
69	Using automatic developer for X-ray and spot films.	X-ray	9
		DRA	8
222	Duplicating forms on duplicating machine.	FHW	4
144	Preparing hot water sterilizer for use.	LPN-U	6
146	Setting autoclave.	LPN-U	6
		MA-U	6
273	Turning on X-ray film developing machine.	DRA	6

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Numbers refer to scale values of the Task Frequency Scale. (B.3).

The second set of tasks probably could be related to Factor Four, but more likely would cluster with tasks of performers in administrative titles.

The third set of tasks are related to the second but seem to deal more specifically with supplies and inventories. These tasks and those in the administrative group are placed in Figure 15 so that they can be seen to lie beside and lead to their comparable level counterparts in Factor Four.

The fourth set of tasks are all very low level tasks.involving little skill and practically no knowledge. These all deal with the use or care of materials and/or equipment or housekeeping activities. It is hard to say whether these tasks would lead to any other factor or simply are unskilled entry level duties which cannot be seen as stepping stones in and of themselves. On Figure 15 these tasks are placed near Factors Three, Five and Six, since they are most closely related to the more manual factors.

CHAPTER 4

TASK SEQUENCES, LATTICES AND CURRICULUM CONTENT

The HSMS task analysis data not only provide insights into the ways in which tasks activities relate to one another, they provide information on the educational content required for task sequences and lattices. This chapter first presents a conceptual discussion about the use of task data for curricula and then presents a detailed account of the curriculum content and lattice relationships for each of the task factors. The last sectior of the chapter deals with current educational locations for the task sequences as derived from the pilot test curriculum analysis described in Chapter 2.

TASK LADDERS AND LATTICES

Job ladders or task sequences refer to vertically promotional steps derived from the grouping of tasks which draw on rising levels of interrelated skills and knowledge. This assumes both the transferability and the additive nature of the skills and knowledge. The HSMS task data make it possible to pinpoint the skills and knowledge needed for every task factor and for each level within a factor. It is thus possible to delineate the necessary curriculum content for each level in a task sequence and also to identify the educational gap between levels. The difference between the highest achieved scale level for each skill and knowledge category at a particular sequence level and the highest necessary scale levels for skills and knowledge at the next sequence level, plus any new skills and knowledge needed at the next level defines the educational gap between levels.

Job lattices or task sequence lattices allow for linkages across ladders both horizontally and diagonally. Where there is transferability of skills and knowledge at a given level there can be crossover options and a choice of promotional pathways. The principle involved is that the skills and knowledge used in a given task sequence level may serve as a basis for more than one specialty. A given specialty may build on more than one kind of prior preparation, and the entry to specific professional jobs could thus be reached in a lattice by more than one sequence. Conversely, a given sequence level can be a step towards more than one specialty.

The same type of analysis of task data can serve to identify the educational gap across sequences. In the HSMS data tasks which load high on more than one factor provide the clue for the most logical lattice possibilities. Later in this chapter the educational content of task sequences and lattices explored in the pilot test will be presented.

CURRICULUM CONTENT AND CURRICULUM DESIGN

This section is offered as a conceptual framework for the discussion of educational content to follow. It is presented to avoid the confusion between tasks and curriculum design on one hand, and between curriculum content identified through the HSMS task data and curriculum design on the other.

Tasks and Curriculum Design

There appears to be a tendency in the field of "para-professional" or "allied health occupations" training to confuse task performance and curriculum design. A number of projects have attempted to design curricula for new occupations or to develop programs for existing occupations with a view towards making some upward mobility possible for health services employees. These projects collect task data to determine what activities the curricula would have to prepare the employees to do, but they then set about to design curricula which would teach students to perform the steps of the tasks, as the tasks are currently being done. That is, the curricula are designed to teach the actual procedures or steps of the tasks, and little more.

The design of curricula based solely on teaching how to do the steps of tasks is a corruption of the possible uses of task analysis in curriculum design. The focus on teaching task procedures makes the curriculum content (and the student) obsolete as soon as technology changes and/or the procedures are changed. This leaves the performer with non-transferable knowledge.

The focus on teaching task procedures does not lay the foundation of skills and knowledge needed to build upon if upward mobility is to be achieved through efficient design of job and curriculum ladders. The objective of job and educational ladders should be to carry the individual potentially through all the steps in a ladder from entry level to professional levels, even though they provide exit points along the way.

The focus on teaching task procedures can leave the performer helpless to adapt to emergencies,since it does not permit the performer to develop and exercise judgmental skills based on comprehension of subject matter. It thus defeats the need to develop flexibility about methods of task performance and about the quality of service to be provided to suit the needs of the situation.

The difference between dead-end jobs which are one or two steps up from the entry level and true career mobility lies in the educational experience. Historically, sub-professional workers have had training in skills, particularly manual skills, and in knowledge which was limited to the on-the-job learning of particular tasks. In contrast, the professional normally learns bodies of knowledge, abstract concepts and laws, or intellectual statements about how things function, why they function, and how these may vary under differing conditions.

The difference in learning which separates the on-the-job trained performer ("first you do this, and then you do that") from the performer trained in terms of organized knowledge ("you have to do certain kinds of things under certain kinds of circumstances") is that the first type of learning is not transferable, and the second is transferable. Transferability of learning means that an investment of time and effort in learning something is usable in more than one context; and this is the basis of mobility.

Task Data and Curriculum Design

While the HSMS method was designed to identify curriculum content beyond the statement of task procedures, it is equally important to differentiate the skill and knowledge data from curriculum design.

The skill and knowledge variables on which the tasks are rated are designed to reflect only attributes which can be treated as additive and which occur at varying levels. The skill and knowledge variables reflect only attributes which are obviously required for task performance. As a consequence, it would be impossible to assume that the task data can cover or provide for coverage of all the curriculum content required to train an individual for a given occupation. Non-transferable, non-additive and prerequisite contents are not covered by the skill and knowledge categories, and cannot be assumed to be covered in the List of Task Elements found on the Task Identification Summary Sheets.

In addition, the language of the knowledge scale,which refers to the depth and breadth of knowledge in the category,is broadly written. This does not substitute for the specific pinpointing of educational objectives and informational objectives in the design of curriculum.

The task statements and the skill and knowledge data can be used as inputs to curriculum design, as a type of checklist for curriculum content. While these data cannot, in and of themselves, be curricula, the task identification data and the skill and knowledge profiles can, however, act as reminders of what must be accounted for.

Very important is the fact that the specific knowledge categories appear at scaled levels in the tasks and task sequence levels. It can be very clear to the educator at what stage a particular subject area must be taught and at what level. In addition, by examining the other tasks and sequence levels in a ladder or lattice, the educator can see what depth and breadth of comprehension will be required of the performer and can plan accordingly.

The educator can use the task data laid out in ladders or lattices to decide when to introduce specific information and subjects, how to introduce them, and how to tie the training to work. More important, in being able to show how the same knowledge or skill is used for more than one task, the educational effort itself can be enhanced, and the ability of the student to generalize and apply his training will be improved.

Job ladders building on the skills as well as on knowledge provide exit points along the way for practice, so that in the next learning sequence, as the individual rises, the prior learning is reinforced and added to. This presupposes that the educational methods will emphasize and amplify the additive nature of the learning and will not provide the training in discrete, disconnected units.

This brings into focus the relevance of teaching the skills directly and in connection with the knowledges to be applied. The intellectual skills, as any others, require practice. The teaching of these skills requires methods of education allowing for the practice of the skills in the process of acquiring knowledge.

THE CONTENT OF TASK SEQUENCES

While there appears to be a great deal of overlap of skill and knowledge requirements in health care, this overlap is more pronounced at the higher levels. And, while many categories are required by many tasks, no category is required by more than fifty percent of the 273 tasks.

The most frequently appearing knowledge category was Asepsis, required above zero in 105 of the tasks; it is followed by Regional Anatomy, required by 104 tasks. The skills are more widely required. There were 267 tasks with ratings above zero on the Consequences of Error to Humans scale.

The fact that higher level tasks require more knowledge categories is reflected in Figure 23. Factors Two and One, which begin at Level 4,require 175 and 158 knowledge categories respectively. However, there are differences among the factors which are independent of level or the number of tasks in the factor. Factor Five, with 90 tasks and represented at Level 6,requires a total of 118 categories compared with 175 for Factor Two or 127 for Factor Six. Factor Three requires the fewest knowledge categories (86).

In Appendix A, Tables A.4 through A.9 present all of the skill and knowledge categories required for each task factor and the number of tasks in that factor requiring each. Tables A.2 and A.3 presents comparable data for the pilot test as a whole.

Figure 23. TOTAL NUMBER OF SKILL AND KNOWLEDGE VARIABLES REQUIRED BY TASK FACTORS OR GROUPS

Factor or Groups	Total Variables Needed[a]		No. of Tasks
	Skills	Know. Cats.	
One: Surgery, Diagnosis and Prescription	14	158	15
Two: Pediatric Diagnosis and Prescription	14	175	11
Three: Machine Related Care and Radiology	15	86	26
Four: Social Service and Counseling	14	114	60
Five: Physical Care and Treatment	16	118	90
Six: Female Care	14	127	27
Unassigned:			
Laboratory Related	14	22	14
Administrative	11	2	9
Inventory and Supply Related	13	3	19
Machine Related and Housekeeping	11	1	18

[a] Required above zero on respective scale for any or all of tasks in factor or group.

It is noteworthy that the skills and knowledge categories needed most frequently are not always those which determine the factor. What determines the factor is the regular relationship among some variables. These tend to rise and fall together, but each may not be present at all levels or in all tasks.

The implications for curriculum from variables that determine factors is that they should be taught in relation to one another, since they are associated, and that they can usually be expected to be required in rising levels or at interrelated levels in their factor.

Factor Five[1]

Factor Five, the Physical Care and Treatment Factor, is represented at all levels except Level 7. The skills which are most frequent and which help determine the factor are Consequence of Error to Humans,

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[1] The factors will not be discussed in numerical order. Factor Five is the most complete factor.

Object Manipulation and Figural Skills; the comparable knowledge categories are Asepsis, Regional Anatomy, Topographic Anatomy and Introductory Procedures.

Figure 24 is the first of a series of Figures which present the skill and knowledge content for task sequence levels. The specialty name of the factor is presented at the top. Each of the levels present in the factor is listed at the top of a column in ascending order from left to right. The skills and knowledges are presented in numerical order as they appear as requirements for a level. For example, there are 16 skills and knowledges required at Level 1, considering all the tasks of Level 1 in Factor Five. The scale value listed is the highest required among the tasks of the level. The scale level for each category or skill is then entered to the right for all the succeeding levels.

As can be seen from Figure 24, Object Manipulation is required at a scale value of 3.5 for Level 1. No additional training is needed to reach Level 2. To go from Level 2 to Level 3, the skill must be taught so that performance can reach a scale value of 7.5. After Level 3, the skill is continued to be needed at 7.5, and no additional specific training is needed.

Regional Anatomy is needed at 1.5 for Levels 1 and 2, rises to 3.5 at Level 3, to 5.5 at Level 4, and again to 7.0 at Level 5. No further education in Regional Anatomy is required to go from Level 5 to Level 6.

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE
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Specialty Name: Physical Care and Treatment						
Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
2 Object Manipulation*	3.5	3.5	7.5	7.5	7.5	7.5
3 Guiding or Steering	1.5	1.5	1.5			
4 Human Interaction	3.0	5.0	7.0	7.0	7.0	3.0
6 Oral Use of a Relevant Language	4.0	4.0	7.5	7.5	4.0	7.5
7 Reading Use of a Relevant Language	2.0	2.0	2.0	2.0	5.0	2.0
8 Written Use of a Relevant Language	2.0	2.0	2.0	5.0	2.0	5.0
9 Decision Making on Methods	1.5	3.0	4.5	4.5	7.0	7.0
10 Decision Making on Quality	3.5	7.0	7.0	7.0	7.0	9.0
15 Financial Consequences of Error	1.0	4.0	1.0	4.0	1.0	1.0
16 Consequences of Error To Humans*	5.5	8.0	8.0	9.0	9.0	9.0
11731100 Regional anatomy*	1.5	1.5	3.5	5.5	7.0	7.0
11733800 Disorders of the respiratory system	1.5	1.5	2.5	3.5	2.5	8.0
11734100 Disorders of skin,subcutaneous tiss.	1.5	1.5	1.5	5.5	5.5	
11737100 Bandages,dressings,tourns., splints.*	1.5	1.5	3.5	5.5	3.5	7.0
11738000 Asepsis	1.5	2.5	3.5	3.5	5.5	5.5
72000000 Cuisine (cooking and baking)	2.5					
11 Figural Skills*		1.0	3.5	3.5	5.0	3.5
12 Symbolic Skills		1.5	1.5	1.5	1.5	1.5
14 Implicative Skills		1.0	2.0	5.0	8.0	8.0
11731200 Topographic anatomy*		1.5	5.5	5.5	7.0	8.0
11731400 Circulatory system*		1.5	3.5	5.5	5.5	8.0
11731500 Respiratory system*		1.5	2.5	5.5	5.5	8.0
11731610 Mouth, pharynx, esophagus		1.5	1.5	5.5		
11731630 Large intestine (colon) and rectum		1.5			8.0	
11731831 Skin and sweat glands		1.5	1.5	5.5	5.5	5.5
11731943 Eye and optic nerve		1.5	3.5		2.5	

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1:217, 213, 166, 260, 180, 181, 153, 193, 183, 182, 214.
Level 2:179,229,152,185,210,215,206,163,224,173,244,199,93,200,201,162,142, 95,96,205,190,194,233,177,188,209,212,195,187,189,256,161,170,198.
Level 3:38,18,112,156,192,167,133,251,57,117,143,92,119,243,232,118,58,104, 109,218,191.
Level 4: 12, 17, 19, 34, 59, 33, 250, 13, 5, 105, 171.
Level 5: 50, 30, 32, 41, 61, 91, 31, 87.
Level 6: 28, 37, 60, 62, 22.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)
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Specialty Name: Physical Care and Treatment

Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11731945 The ear (excluding balance function)		1.5	3.5		2.5	
11733000 Pathology		1.5	2.5	5.5	5.5	5.5
11733100 Infective and parasitic diseases		1.5		3.5	5.5	5.5
11733545 Disorders of the ear		1.5				
11733700 Disorders of the digestive system		1.5	1.5		2.5	5.5
11734600 Burns		1.5	2.5	3.5	3.5	8.0
11735400 Introductory procedures*		1.5	2.5	3.5	7.0	9.0
11737300 Handling,transportation of sick,wounded*		2.5	3.5	5.5	5.5	8.0
11737400 Sprains,strains,fractures;their healing		1.5	3.5	3.5	2.5	8.0
11737500 Foreign bodies not involving wounds		2.5	5.5	7.0	3.5	8.0
11737700 Wounds and their healing		1.5	3.5	5.5	5.5	8.0
11739430 Sanitation		1.5	1.5	2.5	2.5	2.5
11742132 Corrective,preventive,compensat.adjstmts.		1.5	1.5		3.5	2.5
11742143 Heat therapy		1.5				3.5
11743300 Nutritional qualities of foods		1.5	2.5		2.5	
11743400 Nutritional requirements and diets		2.5	2.5	1.5	3.5	3.5
12300000 Pharmacology		1.5	1.5	3.5	2.5	5.5
12331000 Drug toxicity		2.5	1.5	7.0	3.5	7.0
12332000 Drug idiosync.,allergy pharmacogenetics		2.5	1.5	7.0	3.5	7.0
12341100 Antibacterial and antifungal chemotherapy		2.5	2.5	3.5	3.5	5.5
12341200 Antiprotozoal/antimetazoal chemotherapy		1.5	1.5		2.5	3.5
12342100 Drugs act.on cardiovas.sys.,smooth muscle		1.5	2.5	3.5	2.5	8.0
12342200 Drugs acting on blood,immunologic system		1.5	2.5		2.5	5.5
12342300 Hormones,drugs actng. on endocr.glnds.etc.		1.5	2.5		3.5	5.5
12342600 Drgs. for allergy, cough, etc.		1.5	2.5	1.5	2.5	3.5
12342700 Drugs acting on gastrointestinal tract		1.5	2.5		2.5	3.5
12342800 Drugs acting on the nervous system		1.5	2.5		2.5	5.5
12342810 Drugs acting on autonomic nervous system		1.5	1.5		2.5	
12342820 Drugs acting on the neuromuscular system		1.5	1.5		2.5	5.5
12342830 Drugs acting on central nervous system		1.5	1.5		2.5	3.5
1 Locomotion			1.5			1.5
5 Leadership			1.0	1.0	3.0	4.5
11731000 Normal structure and function			2.5	5.5	7.0	8.0
11731600 Digestive system			2.5		5.5	7.0
11731700 Urinary system and external genitalia			2.5	3.5	8.0	5.5
11731810 Muscles			2.5	1.5	7.0	7.0
11731820 Bones and joints			2.5	1.5	8.0	8.0
11731900 Nervous system			1.5	2.5	5.5	7.0
11732210 Endocrine glands; their hormone physiology			2.5		2.5	
11732223 Female reproductive system			1.5	8.0	8.0	
11732400 Metabolism			1.5		5.5	5.5

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)

p. 3 of 4

Specialty Name: Physical Care and Treatment

Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11733300 Endocrine, nutritional, metabolic disorders			2.5		2.5	5.5
11733510 Disorders of the central nervous system			1.5	1.5	7.0	8.0
11733600 Disorders of the circulatory system			2.5	8.0	5.5	8.0
11733900 Disorders of the uro-genital system			2.5	8.0	7.0	
11734200 Disorders of musculoskel. syst., conn. tissues			2.5	1.5	5.5	5.5
11735600 Suture			1.5	3.5	5.5	5.5
11735700 Manipulation			2.5			5.5
11736000 Anesthesiology			1.5	3.5	3.5	3.5
11737200 Hemorrhage, bleeding; their arrest*			1.5	3.5	5.5	8.0
11737600 Resuscitation			1.5	8.0	2.5	8.0
11742110 Kinesiology and body mechanics			2.5			
11742133 Special post-disease, chronic disease therapy			1.5		3.5	
11742148 Exercise			2.5			
11745000 Growth and development			1.5	5.5	5.5	5.5
11745200 Neo-natal period*			2.5	2.5	7.0	7.0
65620000 Mechanics of writing English			3.5	3.5	3.5	3.5
13 Taxonomic Skills				2.0	5.5	5.5
11731930 Autonomic nervous system				2.5	5.5	5.5
11732222 Male reproductive system				1.5	2.5	
11733200 Neoplasms (cancerous growths)				5.5	5.5	
11733520 Disorders of the peripheral nervous system				1.5	5.5	5.5
11734300 Congenital abnormalities				1.5		
11734400 Disorders,complications of preg.,childbirth,puerp.				3.5	8.0	
11734500 Perinatal morbidity and mortality				2.5	9.0	
11734700 Poisoning				3.5	2.5	8.0
11734800 Shock and trauma				3.5	8.0	8.0
11735100 Operative procedures				3.5	3.5	
11737000 First aid and care				5.5	5.5	8.0
11745300 Infant growth*				5.5	7.0	7.0
11745400 Childhood growth				5.5	7.0	7.0
12200000 Radiology				5.5		
12220000 Radiographic (X-ray) analysis				3.5		5.5
12334000 Drug tolerance and physical dependence				2.5	2.5	3.5
12341400 Local chemotherapy				1.5		
14111000 Solutions				2.5		
15212100 Electric circuit theory				2.5		
24130000 Electronics				1.5		
11731300 Hematopoietic system					5.5	5.5
11731620 Stomach and small intestine					8.0	
11731910 Central nervous system					7.0	7.0
11731920 Peripheral nervous system					5.5	5.5

Figure 24. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FIVE (continued)
p. 4 of 4

Specialty Name: Physical Care and Treatment

Sequence Level:[a]	1	2	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11732100 Immunologic system					2.5	3.5
11732220 Reproduction					8.0	
11732221 Conception and contraception					8.0	
11732300 Homeostasis of fluids					5.5	7.0
11733400 Disorders of blood and blood-forming organs					7.0	7.0
11735000 Surgery					3.5	3.5
11735800 Delivery methods for childbirth					2.5	
11741000 Epidemiology					3.5	
11743000 Nutrition and dietetics					2.5	5.5
11745100 Embryology and prenatal period					8.0	
11800000 Microbiology					1.5	
12333000 Drug resistance (of a non-genetic nature)					2.5	
12335000 Drug synergism					2.5	5.5
12342400 Vitamins and nutritional agents					3.5	3.5
41690000 Psychopathology					2.5	
41884200 Health services administration and policy					2.5	
11731832 Hair						3.5
11731833 Nails						3.5
11731941 Olfactory nerve and receptors						3.5
11733530 Disorders of the autonomic nervous system						8.0
11735500 Endoscopy						5.5
11742141 Hydrotherapy						3.5
11743100 Biochemistry of nutrients						5.5
11743200 Physiology of nutrients						5.5
12313000 Drug dose-response relationships						5.5
12321000 Drug absorption						3.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1:217, 213, 166, 260, 180, 181, 153, 193, 183, 182, 214.
Level 2:179,229,152,185,210,215,206,163,224,173,244,199,93,200,201,162,142,95,96,205,190,194,233,177,188,209,212,195,187,189,256,161,170,198.
Level 3:38,18,112,156,192,167,133,251,57,117,143,92,119,243,232,118,58,104,109,218,191.
Level 4: 12, 17, 19, 34, 59, 33, 250, 13, 5, 105, 171.
Level 5: 50, 30, 32, 41, 61, 91, 31, 87.
Level 6: 28, 37, 60, 62, 22.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

As can also be seen from Figure 24, new skills and categories are needed to reach Level 2 from Level 1. These skills and categories are entered below the ones already presented. This process continues for each level, so that an indented progression appears. The educational gap between two levels is the additional scale values needed for skills and categories already introduced plus the new skills and categories needed at the new level.

The reader should note that sometimes a category required for one level is actually needed at a lower scale value for a higher level, and that some skills or categories are not needed at all. The Eye and Optic Nerve is needed at 3.5 for Level 3, not needed for Levels 4 and 6, and needed at 2.5 for Level 5. This information tells the curriculum designer that all the knowledge of The Eye and Optic Nerve ever to be used in this factor should be taught in the education for the rise from Level 2 to Level 3, and then need not be repeated or need only be reviewed. Similarly, Drug Toxicity is required at 3.5 for Level 5 and 7.0 at Level 6. However, since it was already needed at 7.0 for Level 4, there should be no need for new education.[2]

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[2] It might be noted that skills and knowledge variables which do not determine the factor are most likely to be needed in erratic movements from level to level. The interrelationships among variables that determine the factor is apparent on inspection of the names listed with asterisks in the various Figures.

The presentations of which Figure 24 is a prototype provide information on the scale values to be achieved at each level, and permit curriculum designers to plan so as to avoid redundancy. It should be noted that these data are guidelines only. There has not been sufficient review of the data to call them definitive.

Factor Four

Factor Four is the Social Service and Counseling Factor. It actually can be considered to exist at Levels 1, 2, 3b, 4 and 5. Levels 6 and 3a include the types of conference tasks which reflect the performer's other tasks.

As the factor exists it is a truncated version of what might be expected were additional functions to be studied. The tasks of this sequence probably should be combined with other sequences which already require emphasis on Human Interaction, Oral, Written and Reading Use of Language, Decision Making on Quality, Methods and Implicative Skills. As Figure 25 indicates, Levels 3a and 6 include a good deal of medical knowledge because the performers involved in the conference or Team tasks have jobs which require such knowledge.

Factor Six

Factor Six is the specialty in Female Care. It provides a lattice-type entry from other factors, since its tasks begin at Level 3. This factor combines the counseling of Factor Four with the physical

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR
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Specialty Name: Social Service and Counseling						
Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
2 Object Manipulation	3.5	3.5	5.0		1.5	
4 Human Interaction*	5.0	5.0	7.0	7.0	7.0	5.0
5 Leadership	1.0	4.5	4.5	1.0	1.0	
6 Oral Use of a Relevant Language*	4.0	7.5	7.5	4.0	7.5	7.5
7 Reading Use of a Relevant Language*	2.0	5.0	5.0	5.0	5.0	5.0
8 Written Use of a Relevant Language*	5.0	5.0	5.0	6.5	5.0	5.0
9 Decision Making on Methods*	4.5	7.0	4.5	4.5	7.0	4.5
10 Decision Making on Quality*	7.0	7.0	7.0	7.0	7.0	7.0
12 Symbolic Skills	1.5	1.5	1.5		1.5	
14 Implicative Skills*	2.0	5.0	5.0	5.0	5.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0	1.0	1.0
16 Consequences of Error to Humans	5.5	3.0	7.0	5.5	7.0	1.0
11731000 Normal structure and function	1.5	2.5	3.5	7.0	5.5	8.0
11731100 Regional anatomy	1.5	1.5	2.5		3.5	7.0
11731200 Topographic anatomy	1.5		1.5			
11731500 Respiratory system	1.5	1.5	1.5	5.5		8.0
11731831 Skin and sweat glands	1.5		1.5			
11733000 Pathology*	2.5	2.5	3.5	7.0	5.5	8.0
11733200 Neoplasms (cancerous growths)	1.5				3.5	7.0
11734100 Disord. of skin, subcutan. tissues	1.5			3.5	2.5	5.5
11737300 Handling,transport.of sick,wounded	2.5	2.5			3.5	
11737700 Wounds and their healing	1.5		1.5	5.5	2.5	5.5
11738000 Asepsis	1.5	1.5	2.5		5.5	
11739430 Sanitation	1.5	2.5	2.5	2.5	3.5	

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions:
Level 1: 234,259,107,116,138,247,204,211,254,215,126,113,216,106,225,208.
Level 2: 246,159,238,202,124,197,228,221,255,258,240,131,261,253,94,77.
Level 3b: 111,241,219,122,252,148,154,249,203,158,237,245,226,100.
Level 3a: 236, 26, 239, 127, 23.
Level 4: 90, 125, 121, 114, 101, 102, 115, 110.
Level 6: 25

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR (continued)
p. 2 of 4

Specialty Name: Social Service and Counseling						
Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11742110 Kinesiology and body mechanics	1.5					
11742132 Correct.,prevent.,compens.adjustmts.	1.5		1.5		3.5	
11742133 Spec.post-disease,chronic,therapy	1.5		1.5	5.5	3.5	
11743300 Nutritional qualities of foods	1.5		3.5		5.5	
11743400 Nutritional requirements and diets	2.5	2.5	3.5	2.5	5.5	7.0
11745200 Neo-natal period	1.5					
41690000 Psychopathology*	1.5		2.5	3.5	3.5	3.5
65620000 Mechanics of writing English*	2.5	2.5	3.5	5.5	3.5	5.5
11 Figural Skills		1.0	1.0		1.0	
13 Taxonomic Skills		2.0	2.0	2.0	5.5	5.5
11731700 Urinary system, external genitalia		1.5	1.5		2.5	8.0
11732220 Reproduction		2.5	3.5	7.0	5.5	
11732221 Conception and contraception		5.5	3.5	2.5	5.5	
11732222 Male reproductive system		2.5	2.5	2.5	5.5	
11732223 Female reproductive system		3.5	3.5	2.5	5.5	
11733100 Infective and parasitic diseases		2.5	1.5	7.0	3.5	8.0
11733800 Disorders of respiratory system		2.5	1.5	3.5	3.5	8.0
11733900 Disorders of uro-genital system		2.5	1.5	3.5	3.5	7.0
11741000 Epidemiology		2.5		3.5	3.5	3.5
11742148 Exercise		1.5			3.5	
11744100 Oral hygiene and care		2.5			3.5	
12331000 Drug toxicity		1.5		1.5	2.5	
12332000 Drug idiosync.;allergy pharmacogenetics		1.5			2.5	
12342300 Hormones,drugs act.on endocr.glands,etc.		1.5	1.5		2.5	
41884200 Health services administration, policy*		1.5	3.5	5.5	3.5	3.5
72000000 Cuisine (cooking and baking)		2.5	2.5			
11731400 Circulatory system			1.5	5.5		8.0
11731600 Digestive system			1.5			8.0
11731810 Muscles			2.5			
11731820 Bones and joints			2.5			
11731900 Nervous system			3.5		1.5	8.0
11733510 Disorders of the central nervous system			2.5		3.5	
11733520 Disorders of the peripheral nervous system			2.5			
11733530 Disorders of the autonomic nervous system			2.5			
11733600 Disorders of the circulatory system			1.5	3.5	5.5	8.0
11733700 Disorders of the digestive system			1.5	3.5	3.5	8.0
11734300 Congenital abnormalities			1.5	2.5		
11735400 Introductory procedures			1.5		3.5	7.0
11737000 First aid and care			3.5	3.5	5.5	
11743000 Nutrition and dietetics			1.5		3.5	5.5
11745000 Growth and development			3.5	5.5	5.5	5.5

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR FOUR (continued)
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Specialty Name: Social Service and Counseling

Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11745100 Embryology and prenatal period			1.5		2.5	
11745300 Infant growth			3.5			
11745400 Childhood growth			3.5			
11745500 Adolescent growth			1.5		2.5	
11745700 Old age (geriatrics)			2.5		2.5	
12300000 Pharmacology			2.5	5.5	2.5	7.0
12341400 Local chemotherapy			1.5			
12342100 Drugs act.on cardiovas.syst.,smooth muscle			1.5			
41521200 Infant, preschool intelligence; measurement			2.5			
41522000 Differential abilities,aptitudes,measurement			2.5			
41610000 Sensation and perception			1.5			
41660000 Developmt.,growth of behav.processes of indiv.			3.5		3.5	
41666100 Infant behavioral development			2.5			
41666200 Childhood behavioral development			2.5			
41691000 Mental retardation			2.5			
41692000 Organic brain syndrome			2.5			
41710000 Psychotherapy and counseling*			1.5		3.5	
41884000 Social service administration and policy*			2.5	3.5	3.5	3.5
41884100 Soc.serv.for poor,indigent,admin.,policy			1.5	2.5	2.5	
41884300 Educational, training serv.admin.,policy			1.5	1.5	2.5	
41884400 Employment services administration,policy			1.5	1.5	2.5	
41884500 Legal services administration and policy			1.5	1.5	2.5	
41884600 Child care services administration,policy			1.5	2.5	2.5	
41884700 Recreational services admin., policy			1.5	1.5	2.5	
41884800 Spec.services for aged,infirm admin.,policy			2.5	2.5	2.5	
41884900 Consumer protection services admin.,policy			2.5	1.5	2.5	
41885100 Soc. agencies (pub.,priv.) admin., policy*			3.5	2.5	3.5	
43700000 Consumer economics			1.5		2.5	
11733300 Endocrine, nutritional, metabolic disorders				3.5	3.5	7.0
11733400 Disorders of blood, blood-forming organs				2.5	3.5	
11734200 Disorders of musculoskeletal syst.,conn.tissues				2.5	2.5	7.0
11734400 Disorders,complic.of pregnancy,childbirth,puerp.				5.5		
11734600 Burns				3.5		
11734700 Poisoning				3.5		
11735000 Surgery				3.5		5.5
11737400 Sprains,strains,fractures; their healing				5.5		
11739000 Community health and preventive medicine				5.5	2.5	3.5
11742100 Physical therapy				3.5	2.5	5.5
12334000 Drug tolerance and physical dependence				1.5	2.5	
12342810 Drugs acting on the autonomic nervous system				1.5	1.5	
12342830 Drugs acting on the central nervous system				1.5	1.5	
41695200 Disorders involving addictive behavior				2.5		

Figure 25. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES:
FACTOR FOUR (continued)
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Specialty Name: Social Service and Counseling

Sequence Level:[a]	1	2	3b	3a	4	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]					
11732210 Endocrine glands; their hormone physiology					1.5	5.5
11733543 Disorders of the eye and optic nerve					2.5	
11735100 Operative procedures					1.5	
11739100 Treatment of social causes of illness					1.5	
11739300 Rehabilitation, restoration of indiv. to community					1.5	
11745600 Adulthood					2.5	
12335000 Drug synergism					2.5	
12341100 Antibacterial and antifungal chemotherapy					1.5	
12341200 Antiprotozoal/antimetazoal chemotherapy					1.5	
12342800 Drugs acting on the nervous system					2.5	
12342820 Drugs acting on the neuromuscular system					1.5	
41642000 Sex drives					2.5	
41693000 Psychoses					2.5	
41720000 Organic therapy					1.5	
11200000 Genetics						3.5
11732100 Immunologic system						5.5
11736000 Anesthesiology						3.5
11800000 Microbiology						3.5
12200000 Radiology						5.5
12210000 Radiobiology						3.5
12220000 Radiographic (X-ray) analysis						5.5

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions:
Level 1: 234,259,107,116,138,247,204,211,254,215,126,113,216,106,225,208.
Level 2: 246,159,238,202,124,197,228,221,255,258,240,131,261,253,94,77.
Level 3b: 111,241,219,122,252,148,154,249,203,158,237,245,226,100.
Level 3a: 236, 26, 239, 127, 23.
Level 4: 90, 125, 121, 114, 101, 102, 115, 110.
Level 6: 25

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

care of Factor Five. At Level 5, the nature of the tasks suggest a possible entry into Factor Two through Level 4. There are five knowledge categories which both determine the factor and also are present in at least 50 percent of the Factor Six tasks. These are Reproduction, Female Reproductive System, Urinary System and External Genetalia, Disorders of the Uro-genital System, and Infective and Parasitic Diseases.

The interrelationship between this factor and Factors Four and Five indicate the possible benefits of this specialty -- as separate from the traditional Obs-Gyn specialty. That is, that the counseling and educational aspects of sex, conception, contraception, pregnancy, childbirth, physical female disorders and venereal diseases could be more emphasized than is the usual experience with the Obstetrician-Gynecologist, while the medical and physiological aspects of the specialty would redress the absence of adequate training in these areas for the usual counselor in these subjects.

Figure 26 presents the content of the various levels for Factor Six. Most of these present orderly, rising requirements from level to level, with substantial additions of categories between each level.

Factor Three

Factor Three has the interesting characteristic that some of the levels of the task sequences are probably missing. The gap between the X-ray tasks at Level 3 and the fluoroscopy tasks at Level 5, with the latter requiring much diagnostic knowledge, is extremely great. In

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES:
FACTOR SIX
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Specialty Name: Female Care				
Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
2 Object Manipulation	5.0	5.0	7.5	7.5
4 Human Interaction	7.0	7.0	7.0	7.0
5 Leadership	1.0	1.0	3.0	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5	7.5
7 Reading Use of a Relevant Language	2.0	2.0	5.0	5.0
8 Written Use of a Relevant Language	5.0	2.0	5.0	5.0
9 Decision Making on Methods	3.0	7.0	4.5	4.5
10 Decision Making on Quality	7.0	7.0	7.0	7.0
11 Figural Skills	1.0	3.5	5.0	5.0
12 Symbolic Skills	1.5	1.5	1.5	1.5
13 Taxonomic Skills	2.0	2.0	5.5	5.5
14 Implicative Skills	5.0	5.0	8.0	8.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	7.0	8.0	9.0	9.0
11731000 Normal structure and function	2.5	5.5	7.0	8.0
11731100 Regional anatomy	2.5	5.5	7.0	8.0
11731200 Topographic anatomy	1.5	3.5	7.0	8.0
11731400 Circulatory system	1.5	1.5	5.5	8.0
11731500 Respiratory system	1.5	1.5	5.5	8.0
11731600 Digestive system	1.5	1.5	5.5	8.0
11731700 Urinary system and external genitalia*	2.5	3.5	8.0	9.0
11731831 Skin and sweat glands	1.5	2.5	5.5	5.5
11732220 Reproduction*	3.5	5.5	8.0	9.0
11732221 Conception and contraception*	3.5	5.5	8.0	9.0
11732222 Male reproductive system*	1.5	5.5	3.5	8.0
11732223 Female reproductive system*	3.5	8.0	8.0	9.0
11733000 Pathology	2.5	5.5	5.5	8.0
11733100 Infective and parasitic diseases*	1.5	3.5	5.5	8.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 3: 258, 249, 103, 51, 16, 143, 15, 117, 118, 107.
Level 4: 248, 101, 84, 5, 11, 202, 226, 250.
Level 5: 86, 85, 89, 50, 41.
Level 6: 54, 52, 43, 42.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
p. 2 of 4

Specialty Name: Female Care				
Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11733200 Neoplasms (cancerous growths)	1.5	5.5	5.5	8.0
11733600 Disorders of the circulatory system	1.5	1.5	5.5	8.0
11733700 Disorders of the digestive system	1.5	1.5	5.5	8.0
11733800 Disorders of the respiratory system	1.5	2.5	3.5	8.0
11733900 Disorders of the uro-genital system*	2.5	8.0	7.0	8.0
11734100 Disorders of skin and subcutaneous tissues	1.5	3.5	5.5	5.5
11735400 Introductory procedures	2.5	5.5	5.5	8.0
11737700 Wounds and their healing	1.5	2.5	5.5	8.0
11738000 Asepsis	3.5	3.5	5.5	5.5
11800000 Microbiology*	3.5	1.5	1.5	5.5
12342300 Hormones, drugs acting on endocr. glands,etc.	1.5	2.5	2.5	8.0
14128000 Separation methods in analysis	1.5			
65620000 Mechanics of writing English	2.5	5.5	3.5	5.5
11731810 Muscles		1.5	7.0	8.0
11731820 Bones and joints		1.5	3.5	5.5
11731900 Nervous system		1.5	5.5	5.5
11732210 Endocrine glands; their hormone physiology*		1.5	3.5	8.0
11733300 Endocrine, nutritional, metabolic disorders*		1.5	3.5	8.0
11733510 Disorders of the central nervous system		1.5	3.5	5.5
11733520 Disorders of the peripheral nervous system		1.5	3.5	5.5
11734200 Disorders of musculoskel. syst., conn. tissues		1.5	3.5	3.5
11734300 Congenital abnormalities*		1.5	5.5	9.0
11734400 Disorders, complic. of pregnancy, birth, puerp.*		2.5	8.0	9.0
11734500 Perinatal morbidity and mortality*		1.5	9.0	9.0
11735100 Operative procedures*		1.5	3.5	8.0
11735800 Delivery methods for childbirth*		1.5	5.5	9.0
11737300 Handling, transp. of the sick or wounded		2.5	5.5	
11739100 Treatment of social causes of illness		1.5		
11741000 Epidemiology*		3.5	2.5	5.5
11743400 Nutritional requirements and diets		2.5	5.5	8.0
11745000 Growth and development		5.5	5.5	7.0
11745100 Embryology and prenatal period*		2.5	8.0	9.0
11745200 Neo-natal period		2.5	5.5	5.5
11745500 Adolescent growth		2.5		8.0
11745600 Adulthood		2.5	3.5	8.0
11745700 Old age (geriatrics)		2.5		
12200000 Radiology		5.5		5.5
12300000 Pharmacology		2.5	2.5	7.0
12332000 Drug idiosyncrasy; allergy pharmacogenetics		1.5	2.5	7.0
12341100 Antibacterial and antifungal chemotherapy		1.5	2.5	7.0
12341200 Antiprotozoal/antimetazoal chemotherapy		1.5		7.0

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
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Specialty Name: Female Care

Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
14111000 Solutions		2.5		
41642000 Sex drives		2.5		5.5
41660000 Development, growth of behav.processes of indiv.		2.5	2.5	
41690000 Psychopathology		2.5	2.5	3.5
41710000 Psychotherapy and counseling		2.5	2.5	2.5
41884000 Social service administration and policy		2.5		
41884200 Health services administration and policy		1.5	2.5	3.5
41885100 Social agencies (pub.,priv.) admin.,policy		1.5		
11731300 Hematopoietic system			3.5	5.5
11731620 Stomach and small intestine			8.0	8.0
11731630 Large intestine (colon) and rectum			8.0	8.0
11731910 Central nervous system (brain and spinal cord)			3.5	5.5
11731920 Peripheral nervous system			3.5	5.5
11731930 Autonomic nervous system			3.5	7.0
11731943 Eye and optic nerve			3.5	3.5
11731945 The ear (excluding balance function)			2.5	3.5
11732100 Immunologic system			2.5	8.0
11732300 Homeostasis of fluids			5.5	7.0
11732400 Metabolism			5.5	8.0
11733400 Disorders of blood and blood-forming organs			3.5	
11733530 Disorders of the autonomic nervous system			3.5	5.5
11733543 Disorders of the eye and optic nerve			3.5	
11733545 Disorders of the ear			3.5	
11734800 Shock and trauma			8.0	8.0
11735000 Surgery			3.5	8.0
11735600 Suture			1.5	8.0
11736000 Anesthesiology			3.5	8.0
11737000 First aid and care			5.5	7.0
11737100 Bandages, dressings, tourniquets, splints			3.5	5.5
11737200 Hemorrhage and bleeding and their arrest			3.5	8.0
11739430 Sanitation			2.5	
11742132 Corrective, preventive, compens. adjustments			3.5	
11742148 Exercise			2.5	3.5
11743000 Nutrition and dietetics			3.5	5.5
11743300 Nutritional qualities of foods			3.5	
11744100 Oral hygiene and care			2.5	
11745300 Infant growth			3.5	
12331000 Drug toxicity			2.5	7.0
12334000 Drug tolerance and physical dependence			2.5	5.5
12336000 Chemical teratogenesis			3.5	5.5
12342100 Drugs acting on cardiovas. syst., smooth muscle			3.5	8.0

Figure 26. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR SIX (continued)
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Specialty Name: Female Care

Sequence Level:[a]	3	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
12342200 Drugs acting on the blood, immunologic syst.			2.5	8.0
12342400 Vitamins and nutritional agents			2.5	5.5
12342600 Drugs for allergy,cough,vomiting,derm-muc.surfaces			2.5	5.5
12342700 Drugs acting on the gastrointestinal tract			2.5	5.5
12342800 Drugs acting on the nervous system			2.5	5.5
41666100 Infant behavioral development			3.5	
41691000 Mental retardation			2.5	
41884100 Social services for poor, indig., admin.,policy			2.5	
11200000 Genetics*				5.5
11731610 Mouth, pharynx, esophagus				5.5
11731640 Liver, biliary system, and pancreas				5.5
11735300 Repair surgery				8.0
11735500 Endoscopy				5.5
11735700 Manipulation				5.5
11737600 Resuscitation				8.0
11739000 Community health and preventive medicine				5.5
11743100 Biochemistry of nutrients				5.5
11743200 Physiology of nutrients				5.5
12100000 Cell biology				5.5
12110000 Cell morphology				8.0
12210000 Radiobiology				3.5
12220000 Radiographic (X-ray) analysis				5.5
12313000 Drug dose-response relationships				5.5
12321000 Drug absorption				5.5
12322000 Drug distribution				5.5
12323000 Drug excretion				5.5
12333000 Drug resistance (of a non-genetic nature)				5.5
12335000 Drug synergism				5.5
13900000 Biochemical processes and mechanisms				5.5
41650000 Emotions				3.5
41696000 Psychosomatic disorders				3.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 3: 258, 249, 103, 51, 16, 143, 15, 117, 118, 107.
Level 4: 248, 101, 84, 5, 11, 202, 226, 250.
Level 5: 86, 85, 89, 50, 41.
Level 6: 54, 52, 43, 42.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

addition, the more specialized work of the Radiologist that might be reflected at Level 7 is missing. The tasks which would warrant being at Levels 4 or 7 are probably present in the hospital setting.

All of the variables which determine Factor Three are required by 30 percent or more of the tasks of Factor Three. No knowledge categories are required at Level 1. Figural Skills link the tasks at Levels 1 and 2 with Level 3. As Figure 27 indicates, Normal Structure and Function, Topographic Anatomy, Pathology, and Handling and Transportation of the Sick and Wounded link Level 2 (EKG and Eye Testing) with Level 3.

Factor Two

Factor Two, the Pediatric Diagnosis and Prescription specialty, includes examination and assessment tasks for the adult as well as the juvenile at Level 4, but excludes the neonate examination which appears in Factor Six. This is due to differences in knowledge requirements for the tasks.

This factor requires the largest number of knowledge categories and contains the fewest tasks. There are 33 categories which are needed for every task of the eleven represented in the Factor. The magnitude of the rise from the level of Nurse Practitioner (Level 4) to Pediatrician can be understood when it is considered that Level 5 is primarily a teaching level, and Level 6 includes the true pediatric diagnostics. Figure 28 indicates the enormous rise in scale values as well as increase in categories between Levels 4 and 6. This will also explain the educational distance between most other factors and Factor Two.

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE

p. 1 of 3

Specialty Name: Machine Related Care and Radiology					
Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
2 Object Manipulation	3.5	3.5	3.5	3.5	1.5
9 Decision Making on Methods	1.5	3.0	4.5	7.0	9.0
10 Decision Making on Quality	3.5	7.0	7.0	9.0	9.0
11 Figural Skills*	1.0	1.0	5.0	5.0	7.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	1.0	1.0	5.5	7.0	9.0
4 Human Interaction	1.0	5.0	5.0	7.0	3.0
6 Oral Use of a Relevant Language	2.0	4.0	4.0	7.5	7.5
7 Reading Use of a Relevant Language	2.0	2.0	2.0	5.0	5.0
8 Written Use of a Relevant Language	2.0	2.0	2.0	6.5	6.5
12 Symbolic Skills		1.5	1.5	1.5	1.5
14 Implicative Skills		2.0	2.0	8.0	9.0
11731000 Normal structure and function		2.5	2.5	7.0	8.0
11731200 Topographic anatomy*		1.5	3.5	8.0	8.0
11733000 Pathology		1.5	1.5	7.0	8.0
11733543 Disorders of the eye and optic nerve		1.5		3.5	3.5
11733600 Disorders of the circulatory system		1.5		5.5	7.0
11737300 Handling and transport of sick, wounded		2.5	2.5	5.5	
12200000 Radiology*		2.5	2.5	8.0	8.0
12220000 Radiographic (X-ray) analysis*		3.5	3.5	8.0	9.0
65620000 Mechanics of writing English		1.5		3.5	5.5
3 Guiding or Steering			1.5		
5 Leadership			4.5	4.5	
11731100 Regional anatomy			3.5	7.0	8.0
11731600 Digestive system			2.5	8.0	8.0
11731620 Stomach and small intestine			2.5	8.0	8.0
11731630 Large intestine (colon) and rectum			2.5	8.0	8.0
11731700 Urinary system and external genitalia			2.5	7.0	8.0

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1: 71, 78, 263, 272.
Level 2: 73, 74, 262, 270, 257, 99, 82, 79, 132, 271.
Level 3: 68, 67, 65, 66, 81.
Level 5: 1, 3, 4, 7, 20.
Level 6: 6, 8.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE (continued)

p. 2 of 3

Specialty Name: Machine Related Care and Radiology

Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
11735400 Introductory procedures			1.5	5.5	3.5
11738000 Asepsis			1.5		
12210000 Radiobiology*			1.5	5.5	5.5
12332000 Drug idiosyn., allergy pharmacogenetics			1.5		3.5
15212100 Electric circuit theory*			2.5	5.5	
15214200 Optics*			2.5	5.5	3.5
15315000 Optical properties*			1.5	5.5	3.5
13 Taxonomic Skills*				5.5	9.0
11731300 Hematopoietic system				5.5	7.0
11731400 Circulatory system				5.5	8.0
11731500 Respiratory system				7.0	8.0
11731610 Mouth, pharynx (dig. funct.), esophagus				7.0	8.0
11731640 Liver, biliary system, and pancreas				8.0	8.0
11731820 Bones and joints				7.0	8.0
11731943 Eye and optic nerve				5.5	3.5
11731945 The ear (excluding balance function)				3.5	3.5
11732220 Reproduction				5.5	5.5
11732223 Female reproductive system				8.0	8.0
11733100 Infective and parasitic diseases				5.5	7.0
11733200 Neoplasms (cancerous growths)				5.5	7.0
11733300 Endocrine, nutrit., metabolic disorders				5.5	7.0
11733400 Disord. of blood, blood-forming organs				5.5	7.0
11733700 Disorders of the digestive system				8.0	7.0
11733800 Disorders of the respiratory system				5.5	7.0
11733900 Disorders of the uro-genital system				8.0	7.0
11734200 Dis. of musculoskel. sys., conn. tissue				5.5	8.0
11734300 Congenital abnormalities				3.5	7.0
11735000 Surgery				3.5	5.5
11737000 First aid and care				8.0	
11737400 Sprains, strains, fractures; their healing				5.5	8.0
11737500 Foreign bodies not involving wounds				3.5	5.5
11742131 Amputation adjustments				3.5	2.5
11742132 Corrective, prevent. and comp. adjust.				3.5	3.5
11745000 Growth and development				5.5	7.0
12342300 Horm.,drugs on endo.glnds,acc.repro.org.				5.5	5.5
12342700 Drugs acting on gastrointestinal tract				3.5	5.5
14111000 Solutions				2.5	
11200000 Genetics					2.5
11731831 Skin and sweat glands					5.5
11731900 Nervous system					7.0
11731941 Olfactory nerve and receptors					3.5

Figure 27. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR THREE (continued)

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Specialty Name: Machine Related Care and Radiology

Sequence Level:[a]	1	2	3	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]				
11732210 Endocrine glands and hormone physiology					7.0
11732221 Conception and contraception					5.5
11732222 Male reproductive system					5.5
11733510 Disorders of the central nervous system					7.0
11733520 Disorders of the peripheral nervous system					7.0
11733530 Disorders of the autonomic nervous system					7.0
11733541 Disorders of olfactory nerve, receptors					3.5
11733545 Disorders of the ear					3.5
11734100 Disord. of skin, subcutaneous tissues					5.5
11734400 Disord.,complic.pregnancy, birth, puerp.					7.0
11734600 Burns					5.5
11734700 Poisoning					7.0
11734800 Shock and trauma					2.5
11735100 Operative procedures					5.5
11735200 Amputation and disarticulation					5.5
11735300 Repair surgery					5.5
11735500 Endoscopy					5.5
11735700 Manipulation					5.5
11742100 Physical therapy					3.5
11742110 Kinesiology and body mechanics					3.5
11742120 Disability evaluation					3.5
11744200 Oral surgery					2.5
11800000 Microbiology					3.5
12100000 Cell biology					3.5
12230000 Radioisotope scanning					5.5
12300000 Pharmacology					5.5
12321000 Drug absorption					3.5
12322000 Drug distribution					5.5
12331000 Drug toxicity					3.5
12336000 Chemical teratogenesis					5.5
12338000 Chemical carcinogenesis					5.5
12342100 Drugs act.on cardiovas.sys.,smooth mus.					5.5

* Asterisk indicates interrelated variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 1: 71, 78, 263, 272.
Level 2: 73, 74, 262, 270, 257, 99, 82, 79, 132, 271.
Level 3: 68, 67, 65, 66, 81.
Level 5: 1, 3, 4, 7, 20.
Level 6: 6, 8.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO

p. 1 of 5

Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
2 Object Manipulation	5.0	5.0	7.5
4 Human Interaction	5.0	7.0	7.0
5 Leadership	3.0	4.5	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5
7 Reading Use of a Relevant Language	5.0	7.0	7.0
8 Written Use of a Relevant Language	5.0	5.0	9.0
9 Decision Making on Methods	4.5	7.0	7.0
10 Decision Making on Quality	7.0	7.0	9.0
11 Figural Skills	1.0	1.0	3.5
12 Symbolic Skills	1.5	1.5	1.5
13 Taxonomic Skills	5.5	5.5	7.0
14 Implicative Skills	5.0	5.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0
16 Consequences of Error To Humans	5.5	5.5	9.0
11731000 Normal structure and function	7.0	7.0	9.0
11731100 Regional anatomy	3.5	5.5	9.0
11731200 Topographic anatomy	3.5	5.5	9.0
11731300 Hematopoietic system*	5.5	3.5	8.0
11731400 Circulatory system	7.0	5.5	8.0
11731500 Respiratory system	7.0	5.5	8.0
11731600 Digestive system	7.0	5.5	8.0
11731700 Urinary system and external genitalia	7.0	5.5	8.0
11731810 Muscles	5.5	5.5	8.0
11731820 Bones and joints	5.5	5.5	8.0
11731831 Skin and sweat glands	5.5	5.5	8.0
11731832 Hair	2.5	3.5	7.0
11731833 Nails	2.5	3.5	7.0
11731900 Nervous system	5.5	5.5	8.0
11731943 Eye and optic nerve*	2.5	5.5	7.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 88, 83, 24.
Level 5: 29, 123, 120.
Level 6: 55, 63, 64, 56, 27.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
p. 2 of 5

Specialty Name: Pediatric Diagnosis and Prescription

Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
11731945 The ear (excluding balance function)*	2.5	5.5	7.0
11732100 Immunologic system*	5.5	5.5	8.0
11732210 Endocrine glands, their hormone physiology	5.5	5.5	8.0
11732220 Reproduction	5.5	5.5	8.0
11732222 Male reproductive system*	3.5	5.5	7.0
11732223 Female reproductive system	3.5	5.5	8.0
11732400 Metabolism	5.5	3.5	8.0
11733000 Pathology	7.0	7.0	8.0
11733100 Infective and parasitic diseases	7.0	7.0	8.0
11733200 Neoplasms (cancerous growths)	5.5	3.5	8.0
11733300 Endocrine, nutritional, metabolic disorders	5.5	5.5	8.0
11733400 Disorders of blood and blood-forming organs*	5.5	5.5	7.0
11733510 Disorders of the central nervous system	5.5	5.5	8.0
11733520 Disorders of the peripheral nervous system*	5.5	5.5	7.0
11733530 Disorders of the autonomic nervous system	5.5	5.5	7.0
11733543 Disorders of the eye and optic nerve*	5.5	3.5	7.0
11733545 Disorders of the ear*	2.5	3.5	7.0
11733600 Disorders of the circulatory system	7.0	5.5	8.0
11733700 Disorders of the digestive system*	7.0	5.5	8.0
11733800 Disorders of the respiratory system	5.5	5.5	8.0
11733900 Disorders of the uro-genital system	5.5	5.5	8.0
11734100 Disorders of the skin and subcutaneous tissues	5.5	5.5	7.0
11734200 Disorders of musculoskel.syst.,conn.tissues*	5.5	5.5	7.0
11734300 Congenital abnormalities*	3.5	3.5	8.0
11734400 Disorders, complications of preg.,birth,puerp.	5.5	5.5	7.0
11734600 Burns*	5.5	5.5	7.0
11734700 Poisoning*	5.5	5.5	8.0
11734800 Shock and trauma	3.5	5.5	8.0
11735000 Surgery	5.5		5.5
11737000 First aid and care	3.5	7.0	8.0
11737200 Hemorrhage and bleeding and their arrest	3.5	5.5	8.0
11737300 Handling, transportation of sick, wounded*	3.5	5.5	8.0
11737400 Sprains, strains, fractures and their healing*	5.5	5.5	8.0
11737700 Wounds and their healing	5.5	5.5	8.0
11738000 Asepsis	3.5	5.5	7.0
11739430 Sanitation*	2.5	3.5	5.5
11741000 Epidemiology*	3.5	3.5	5.5
11742100 Physical therapy*	3.5	3.5	5.5
11742132 Corrective, preventive, compensatory adjustments*	2.5	3.5	7.0
11742133 Special post-disease, chronic disease therapy*	5.5	5.5	7.0
11743300 Nutritional qualities of foods*	2.5	5.5	7.0

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
p. 3 of 5

Specialty Name: Pediatric Diagnosis and Prescription			
Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
11743400 Nutritional requirements and diets*	5.5	7.0	8.0
11744100 Oral hygiene and care*	3.5	3.5	5.5
11745000 Growth and development	5.5	7.0	8.0
11745300 Infant growth*	3.5	5.5	9.0
11745400 Childhood growth*	5.5	5.5	9.0
11745500 Adolescent growth*	3.5	5.5	8.0
11745600 Adulthood*	3.5	5.5	7.0
11745700 Old age (geriatrics)*	3.5	5.5	5.5
11800000 Microbiology*	2.5	2.5	5.5
12300000 Pharmacology	5.5	5.5	7.0
12331000 Drug toxicity	5.5	5.5	8.0
12332000 Drug idiosyncrasy and allergy pharmacogenetics	5.5	5.5	8.0
12333000 Drug resistance (of a non-genetic nature)*	5.5	5.5	8.0
12334000 Drug tolerance and physical dependence*	5.5	5.5	8.0
12335000 Drug synergism	2.5	5.5	7.0
12341100 Antibacterial and antifungal chemotherapy	2.5	5.5	8.0
12341200 Antiprotozoal/antimetazoal chemotherapy*	2.5	5.5	8.0
12341400 Local chemotherapy*	3.5	5.5	8.0
12342100 Drugs acting on cardiovas. syst., smooth muscle	2.5	5.5	8.0
12342200 Drugs acting on the blood and immunologic system	2.5	5.5	8.0
12342300 Hormones, drugs acting on endocr. glands., etc.	2.5	5.5	8.0
12342400 Vitamins and nutritional agents*	2.5	5.5	8.0
12342500 Drugs influencing growth and development	2.5		8.0
12342600 Drugs for allergy, cough, vomiting, dermat.surfs.*	2.5	5.5	8.0
12342700 Drugs acting on the gastrointestinal tract*	2.5	5.5	8.0
12342800 Drugs acting on the nervous system	2.5	5.5	7.0
12342820 Drugs acting on the neuromuscular system	2.5	3.5	7.0
41660000 Development,growth of behavioral processes of ind*	3.5	5.5	7.0
41666100 Infant behavioral development	3.5	3.5	8.0
41666200 Childhood behavioral development	5.5	3.5	8.0
41666300 Adolescent behavioral development	3.5	3.5	7.0
41666500 Young adulthood behavioral development	2.5	3.5	5.5
41666500 Adult behavioral development	2.5	3.5	
41666600 Old age behavioral development	2.5	3.5	
41690000 Psychopathology*	3.5	5.5	5.5
41691000 Mental retardation*	2.5		7.0
41692000 Organic brain syndrome*	2.5		7.0
41697000 Transient situational disturbances*	2.5		7.0
41710000 Psychotherapy and counseling*	2.5	3.5	5.5
41720000 Organic therapy	1.5	1.5	3.5
41884200 Health services administration and policy	2.5	3.5	3.5

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
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Specialty Name: Pediatric Diagnosis and Prescription

Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
41884300 Educational, training services admin., policy	2.5	2.5	
41884600 Child care services administration, policy	3.5	3.5	
41884700 Recreational services administration, policy	2.5	2.5	
41885100 Social agencies (pub.priv.) admin., policy	3.5	3.5	
65620000 Mechanics of writing English	3.5	3.5	5.5
11731610 Mouth, pharynx (digestive function), esophagus		5.5	8.0
11731620 Stomach and small intestine		5.5	8.0
11731630 Large intestine (colon) and rectum		5.5	8.0
11731640 Liver, biliary system, and pancreas		5.5	8.0
11731910 Central nervous system (brain and spinal cord)		5.5	8.0
11731920 Peripheral nervous system		3.5	8.0
11731930 Autonomic nervous system		3.5	8.0
11731941 Olfactory nerve and receptors		3.5	7.0
11731946 Kinesthetic receptors		5.5	7.0
11732221 Conception and contraception*		5.5	7.0
11732300 Homeostasis of fluids		3.5	8.0
11733541 Disorders of the olfactory nerve and receptors		3.5	7.0
11734500 Perinatal morbidity and mortality		5.5	8.0
11735400 Introductory procedures		3.5	5.5
11735600 Suture		3.5	5.5
11735700 Manipulation		3.5	5.5
11736000 Anesthesiology		2.5	3.5
11737100 Bandages, dressings, tourniquets and splints		5.5	8.0
11737500 Foreign bodies not involving wounds*		3.5	7.0
11737600 Resuscitation		3.5	8.0
11742148 Exercise*		3.5	5.5
11743000 Nutrition and dietetics		5.5	5.5
11745100 Embryology and prenatal period		3.5	5.5
11745200 Neo-natal period*		5.5	9.0
12220000 Radiographic (X-ray) analysis		3.5	7.0
12336000 Chemical teratogenesis		3.5	5.5
12341300 Cancer and virus chemotherapy		3.5	7.0
12342810 Drugs acting on the autonomic nervous system		3.5	7.0
12342830 Drugs acting on the central nervous system		3.5	7.0
41523000 Achievement and achievement measurement		1.5	2.5
41695200 Disorders involving addictive behavior		3.5	5.5
41884000 Social service administration and policy		3.5	3.5
41884100 Social services for poor or indigent, admin., policy		3.5	
41884400 Employment services administration, policy		2.5	
41884500 Legal services administration, policy		2.5	
41884800 Special services for the aged or infirm admin., policy		2.5	

Figure 28. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR TWO (continued)
p. 5 of 5

Specialty Name: Pediatric Diagnosis and Prescription

Sequence Level:[a]	4	5	6
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]		
41884900 Consumer protection services admin., policy		2.5	
42300000 Systems of content presentation		2.5	3.5
43700000 Consumer economics		2.5	
11200000 Genetics*			5.5
11731942 Taste buds			7.0
11731944 Touch, heat, cold and pain receptors			7.0
11733542 Disorders of the taste buds			7.0
11733544 Disorders of touch, heat, cold and pain receptors			7.0
11733546 Disorders of kinesthetic receptors			7.0
11735100 Operative procedures			3.5
11735500 Endoscopy			5.5
11735800 Delivery methods for childbirth			5.5
11739000 Community health and preventive medicine			3.5
11739100 Treatment of social causes of illness			5.5
11742120 Disability evaluation			3.5
11742210 Speech therapy			3.5
11742220 Hearing therapy			3.5
11743100 Biochemistry of nutrients			5.5
11743200 Physiology of nutrients			5.5
12100000 Cell biology			3.5
12311000 Drug receptor theory			7.0
12312000 Drug structure-activity relationships			7.0
12313000 Drug dose-response relationships			7.0
12314000 Non-receptor mediated drug action			7.0
12321000 Drug absorption			7.0
12322000 Drug distribution			7.0
12323000 Drug excretion			7.0
12324000 Drug metabolism			7.0
13900000 Biochemical processes and mechanisms			3.5
41521200 Infant and preschool intelligence; measurement			5.5
41522000 Differential abilities and aptitudes; measurement			5.5
41610000 Sensation and perception			5.5
41693000 Psychoses			5.5
41694000 Neuroses			5.5
41695100 Personality disorders			5.5
41696000 Psychosomatic disorders*			7.0
42630000 Professional and graduate education			2.5

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 88, 83, 24.
Level 5: 29, 123, 120.
Level 6: 55, 63, 64, 56, 27.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Factor One

Factor One has no tasks that are currently being performed below the physician level. It essentially has three levels represented, from Level 5 to Level 7. (Level 4 contains one task.) As can be seen from Figure 29, Level 7 calls for rises in the skills and knowledge related to the performance of surgery, such as Object Manipulation, Circulatory System, Operative Procedures, Hemorrhage, Bleeding and Their Arrest, Wounds and Their Healing,and Suture. Categories related specifically to diagnosis, such as Genetics, Cell Biology, Poisoning, and Foreign Bodies, disappear in Level 7's surgery tasks. It is interesting to note that no new categories appear between Levels 6 and 7. This is because the decisions about what to do, appear in Level 6, even though Level 7 involves carrying out the surgery tasks.

Unassigned Task Groups

Figure 30 presents the skills and knowledge accounted for by the unassigned task groupings and presents data on the highest scale value required for each, by groups. The Laboratory Related tasks involve at least three levels, and require scale values as high as 7.0 in categories such as Cell Biology and Cell Morphology. On the other hand, the Machine Related and Housekeeping tasks are all at Level 1, and require only Asepsis, Pharmocology and Mechanics of Writing English,at 1.5 for each. Such unassigned tasks can easily be used as entry avenues to factors, since they require little or no formal training aside from skills.

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Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE
p. 1 of 5

Specialty Name: Surgery, Diagnosis and Prescription

Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
2 Object Manipulation	7.5	7.5	5.0	9.0
4 Human Interaction	7.0	7.0	7.0	7.0
5 Leadership*	1.0	6.5	6.5	6.5
6 Oral Use of a Relevant Language	7.5	7.5	7.5	4.0
7 Reading Use of a Relevant Language	2.0	5.0	5.0	5.0
8 Written Use of a Relevant Language	2.0	5.0	5.0	5.0
9 Decision Making on Methods	4.5	7.0	7.0	7.0
10 Decision Making on Quality	7.0	9.0	9.0	7.0
11 Figural Skills*	5.0	3.5	5.0	5.0
12 Symbolic Skills*	1.5	1.5	1.5	1.5
13 Taxonomic Skills*	5.5	5.5	7.0	7.0
14 Implicative Skills*	8.0	8.0	9.0	9.0
15 Financial Consequences of Error	1.0	1.0	1.0	1.0
16 Consequences of Error To Humans	5.5	9.0	9.0	9.0
11200000 Genetics	5.5	2.5	5.5	
11731000 Normal structure and function*	8.0	8.0	9.0	8.0
11731100 Regional anatomy*	7.0	8.0	9.0	8.0
11731200 Topographic anatomy*	8.0	8.0	8.0	8.0
11731400 Circulatory system*	5.5	8.0	8.0	9.0
11731500 Respiratory system*	5.5	8.0	8.0	8.0
11731600 Digestive system*	5.5	8.0	8.0	8.0
11731700 Urinary system and external genitalia*	8.0	8.0	9.0	9.0
11731810 Muscles*	3.5	7.0	8.0	8.0
11731900 Nervous system*	5.5	7.0	8.0	8.0
11731910 Central nervous system*	3.5	7.0	8.0	8.0
11731920 Peripheral nervous system*	3.5	7.0	8.0	8.0
11731930 Autonomic nervous system*	7.0	7.0	8.0	9.0
11732210 Endocrine glands; hormone physiology*	8.0	8.0	8.0	8.0

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 42.
Level 5: 45, 40, 53, 28.
Level 6: 21, 46, 43, 9, 39, 10.
Level 7: 47, 49, 48, 44.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES:
FACTOR ONE (continued)
p. 2 of 5

Specialty Name: Surgery, Diagnosis and Prescription

Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11732220 Reproduction*	9.0	8.0	9.0	9.0
11732221 Conception and contraception	9.0	8.0	9.0	9.0
11732222 Male reproductive system	8.0	7.0	8.0	
11732223 Female reproductive system*	9.0	9.0	9.0	9.0
11732400 Metabolism*	8.0	7.0	8.0	8.0
11733000 Pathology*	7.0	8.0	8.0	8.0
11733100 Infective and parasitic diseases*	8.0	8.0	8.0	8.0
11733200 Neoplasms (cancerous growths)*	8.0	7.0	8.0	8.0
11733300 Endocrine, nutritional, metabolic disorders*	8.0	8.0	8.0	9.0
11733510 Disorders of the central nervous system*	5.5	8.0	8.0	8.0
11733520 Disorders of the peripheral nervous system*	5.5	5.5	7.0	8.0
11733530 Disorders of the autonomic nervous system*	5.5	8.0	8.0	8.0
11733600 Disorders of the circulatory system*	5.5	8.0	8.0	9.0
11733700 Disorders of the digestive system*	5.5	8.0	8.0	8.0
11733900 Disorders of the uro-genital system*	8.0	8.0	9.0	9.0
11734400 Disorders,complications of preg.,birth,puerp.	8.0	9.0	9.0	9.0
11734800 Shock and trauma*	3.5	8.0	8.0	9.0
11735000 Surgery*	5.5	5.5	8.0	8.0
11735100 Operative procedures*	5.5	5.5	5.5	8.0
11735400 Introductory procedures*	8.0	9.0	9.0	8.0
11737200 Hemorrhage and bleeding and their arrest*	3.5	8.0	8.0	9.0
11737700 Wounds and their healing*	3.5	8.0	7.0	9.0
11738000 Asepsis*	5.5	5.5	5.5	7.0
11743000 Nutrition and dietetics*	3.5	5.5	5.5	5.5
11745000 Growth and development*	5.5	7.0	8.0	8.0
11745100 Embryology and prenatal period*	8.0	8.0	9.0	9.0
11745500 Adolescent growth	8.0	5.5	8.0	
11745600 Adulthood	8.0	7.0	9.0	
12100000 Cell biology	5.5		3.5	
12110000 Cell morphology	8.0		3.5	
12300000 Pharmacology*	5.5	7.0	7.0	7.0
12313000 Drug dose-response relationships*	5.5	8.0	8.0	7.0
12321000 Drug absorption*	5.5	8.0	8.0	7.0
12322000 Drug distribution*	5.5	8.0	8.0	7.0
12323000 Drug excretion*	5.5	8.0	8.0	7.0
12331000 Drug toxicity*	5.5	8.0	8.0	8.0
12332000 Drug idiosyncrasy, allergy pharmacogenetics*	5.5	8.0	8.0	8.0
12333000 Drug resistance (of a non-genetic nature)*	5.5	8.0	8.0	8.0
12334000 Drug tolerance and physical dependence*	5.5	8.0	8.0	7.0
12335000 Drug synergism*	5.5	7.0	8.0	7.0
12341100 Antibacterial, antifungal chemotherapy*	5.5	8.0	8.0	8.0

Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES: FACTOR ONE (continued)
p. 3 of 5

Specialty Name: Surgery, Diagnosis and Prescription

Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
12341200 Antiprotozoal/antimetazoal chemotherapy*	5.5	5.5	8.0	8.0
12342300 Hormones,drugs acting on endoc.glnds.etc.*	5.5	8.0	8.0	8.0
12342800 Drugs acting on the nervous system*	5.5	5.5	8.0	8.0
13900000 Biochemical processes and mechanisms*	5.5	3.5	5.5	5.5
41642000 Sex drives	5.5	3.5	3.5	
41650000 Emotions	3.5	3.5	3.5	
41696000 Psychosomatic disorders*	3.5	3.5	7.0	
41710000 Psychotherapy and counseling	2.5		3.5	
65620000 Mechanics of writing English*	3.5	5.5	5.5	5.5
11731300 Hematopoietic system*		5.5	7.0	5.5
11731610 Mouth, pharynx, esophagus*		5.5	8.0	8.0
11731620 Stomach and small intestine*		8.0	8.0	9.0
11731630 Large intestine (colon) and rectum*		8.0	8.0	9.0
11731640 Liver, biliary system, and pancreas*		8.0	8.0	9.0
11731820 Bones and joints*		7.0	7.0	8.0
11731831 Skin and sweat glands*		5.5	7.0	8.0
11731941 Olfactory nerve and receptors		5.5	8.0	
11731943 Eye and optic nerve*		5.5	5.5	5.5
11731944 Touch, heat, cold and pain receptors		5.5	5.5	
11731945 The ear (excluding balance function)*		5.5	5.5	5.5
11731946 Kinesthetic receptors		5.5	5.5	
11732100 Immunologic system*		7.0	8.0	5.5
11732300 Homeostasis of fluids*		7.0	9.0	8.0
11733400 Disorders of blood, blood-forming organs		7.0	8.0	
11733543 Disorders of the eye and optic nerve		5.5	5.5	
11733544 Disorders of touch, heat, cold, pain receptors		5.5	5.5	
11733545 Disorders of the ear		5.5	5.5	
11733546 Disorders of kinesthetic receptors		5.5	5.5	
11733800 Disorders of the respiratory system*		8.0	8.0	8.0
11734100 Disorders of the skin, subcutaneous tissues*		5.5	8.0	8.0
11734200 Disorders of the musculoskel.syst.,conn. tissues*		5.5	7.0	8.0
11734300 Congenital abnormalities		8.0	9.0	8.0
11734500 Perinatal morbidity and mortality		8.0	9.0	9.0
11734600 Burns		8.0	8.0	
11734700 Poisoning		8.0	8.0	
11735300 Repair surgery		3.5	5.5	8.0
11735500 Endoscopy*		5.5	5.5	8.0
11735600 Suture*		5.5	5.5	8.0
11735700 Manipulation*		5.5	5.5	7.0
11735800 Delivery methods for childbirth		8.0	9.0	8.0
11736000 Anesthesiology*		5.5	8.0	8.0

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Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES:
FACTOR ONE (continued)
p. 4 of 5

Specialty Name: Surgery, Diagnosis and Prescription

Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11737000 First aid and care*		8.0	7.0	8.0
11737100 Bandages, dressings, tourniquets, splints*		5.5	7.0	9.0
11737300 Handling, transportation of sick, wounded		8.0	7.0	
11737400 Sprains, strains, fractures and their healing		8.0	7.0	
11737500 Foreign bodies not involving wounds		8.0	5.5	
11737600 Resuscitation*		8.0	8.0	9.0
11741000 Epidemiology		5.5	5.5	
11742132 Corrective, preventive, compensatory adjustments		3.5	5.5	
11742133 Special post-disease, chronic disease therapy		5.5	8.0	
11742148 Exercise		2.5	3.5	3.5
11743100 Biochemistry of nutrients*		5.5	5.5	5.5
11743200 Physiology of nutrients*		5.5	5.5	5.5
11743300 Nutritional qualities of foods		5.5	2.5	
11743400 Nutritional requirements and diets*		8.0	8.0	5.5
11744100 Oral hygiene and care		3.5	3.5	
11800000 Microbiology		3.5	5.5	
12200000 Radiology		3.5	5.5	5.5
12210000 Radiobiology		3.5	5.5	
12220000 Radiographic (X-ray) analysis*		5.5	5.5	5.5
12311000 Drug receptor theory		5.5	7.0	
12312000 Drug structure-activity relationships		5.5	7.0	
12314000 Non-receptor mediated drug action		5.5	7.0	
12324000 Drug metabolism		5.5	7.0	
12336000 Chemical teratogenesis		8.0	8.0	5.5
12341400 Local chemotherapy		5.5	8.0	
12342100 Drugs acting on cardiovasc.syst.,smooth muscles*		7.0	8.0	8.0
12342200 Drugs acting on the blood, immunologic system*		7.0	8.0	8.0
12342400 Vitamins and nutritional agents*		5.5	7.0	7.0
12342500 Drugs influencing growth and development		5.5	5.5	
12342600 Drugs for allergy,cough,vomit.,dermatomuc.surfs.*		7.0	8.0	7.0
12342700 Drugs acting on the gastrointestinal tract*		7.0	8.0	8.0
12342810 Drugs acting on the autonomic nervous system		5.5	8.0	
12342820 Drugs acting on the neuromuscular system		5.5	8.0	
12342830 Drugs acting on the central nervous system		5.5	8.0	
41660000 Development, growth of behav. processes of indiv.		5.5	3.5	
41690000 Psychopathology		5.5	5.5	
41694000 Neuroses		3.5	3.5	
41695200 Disorders involving addictive behavior		3.5	5.5	
41697000 Transient situational disturbances*		3.5	5.5	
41884200 Health services administration and policy		3.5	3.5	
42630000 Professional and graduate education		1.5	2.5	

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Figure 29. SKILL AND KNOWLEDGE REQUIREMENTS FOR TASK SEQUENCES:
FACTOR ONE (continued)
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Specialty Name: Surgery, Diagnosis and Prescription

Sequence Level:[a]	4	5	6	7
Category Number and Name[b]	Highest Necessary Scale Values for Level[c]			
11731832 Hair			7.0	
11731833 Nails			5.5	
11731942 Taste buds			5.5	
11733541 Disorders of the olfactory nerve, receptors			5.5	
11733542 Disorders of the taste buds			5.5	
11735200 Amputation and disarticulation			3.5	
11739000 Community health and preventive medicine			3.5	
11739430 Sanitation			2.5	
11742100 Physical therapy			3.5	
11742120 Disability evaluation			2.5	
11742131 Amputation adjustments			3.5	
11742143 Heat therapy			3.5	
11745200 Neo-natal period			5.5	5.5
11745400 Childhood growth			7.0	
11745700 Old age (geriatrics)			9.0	
12120000 Cell physiology			3.5	
14111000 Solutions			5.5	
14128000 Separation methods in analysis			3.5	
41691000 Mental retardation			3.5	
41692000 Organic brain syndrome			5.5	
41693000 Psychoses			5.5	

* Asterisk indicates variable determining factor.

[a] Tasks included in levels are as follows. See Table A.1 for task descriptions.
Level 4: 42.
Level 5: 45, 40, 53, 28.
Level 6: 21, 46, 43, 9, 39, 10.
Level 7: 47, 49, 48, 44.

[b] For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 30.

SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a]

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Name of Grouping: Laboratory Related Tasks (14 Tasks)		Highest Necessary Scale Values for Group[c]
Category Name and Number[b] (Tasks 36, 14, 35, 139, 207, 172, 141, 98, 108, 140, 155, 97, 147, 196.)	Total Tasks	
2 Object Manipulation	14	3.5
4 Human Interaction	11	5.0
6 Oral Use of a Relevant Language	11	4.0
7 Reading Use of a Relevant Language	14	2.0
8 Written Use of a Relevant Language	12	2.0
9 Decision Making on Methods	14	1.5
10 Decision Making on Quality	14	3.5
11 Figural Skills	8	5.0
12 Symbolic Skills	1	1.5
13 Taxonomic Skills	3	5.5
14 Implicative Skills	8	5.0
15 Financial Consequences of Error	11	1.0
16 Consequences of Error To Humans	14	7.0
11731100 Regional anatomy	1	1.5
11731630 Large intestine (colon) and rectum	1	1.5
11731700 Urinary system and external genitalia	1	1.5
11733000 Pathology	2	1.5
11733100 Infective and parasitic diseases	3	1.5
11733200 Neoplasms (cancerous growths)	1	3.5
11733300 Endocrine, nutritional, and metabolic disorders	2	1.5
11733400 Disorders of blood and blood-forming organs	1	1.5
11733700 Disorders of the digestive system	1	1.5
11733900 Disorders of the uro-genital system	1	1.5
11734100 Disorders of the skin and subcutaneous tissues	2	1.5
11734700 Poisoning	1	1.5
11738000 Asepsis	2	1.5
11800000 Microbiology	3	5.5
11900000 Molecular biology	1	5.5
12100000 Cell biology	2	7.0
12110000 Cell morphology	2	7.0
12120000 Cell physiology	1	5.5
13900000 Biochemical processes and mechanisms	1	5.5
14121000 Mechanical analysis	1	2.5
14128000 Separation methods in analysis	2	2.5
65620000 Mechanics of writing English	3	2.5

[a] Unassigned to any task factor by virtue of low factor loadings and/or unrelatedness to context of factor content.

[b] See Table A.1 for task descriptions. For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

Figure 30.

SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a] (continued)

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Name of Grouping: Administrative Tasks (9 Tasks)	Total Tasks	Highest Necessary Scale Values for Group[c]
Category Name and Number[b] (Tasks 165, 186, 242, 157, 134, 164, 220, 160, 75.)		
4 Human Interaction	8	3.0
5 Leadership	1	3.0
6 Oral Use of a Relevant Language	8	4.0
7 Reading Use of a Relevant Language	8	5.0
8 Written Use of a Relevant Language	4	5.0
9 Decision Making on Methods	9	3.0
10 Decision Making on Quality	9	7.0
12 Symbolic Skills	1	1.5
14 Implicative Skills	2	2.0
15 Financial Consequences of Error	5	1.0
16 Consequences of Error To Humans	8	1.0
65620000 Mechanics of writing English	2	2.5
69214200 Spanish	1	5.5

Name of Grouping: Inventory and Supply Related Tasks (19 Tasks)	Total Tasks	Highest Necessary Scale Values for Group[c]
Category Name and Number[b] (Tasks 76,128,129,235,150,264, 136,130,151,176,266,80,230,137,168,169,231,265,184.)		
2 Object Manipulation	9	1.5
4 Human Interaction	13	1.0
5 Leadership	2	1.0
6 Oral Use of a Relevant Language	13	2.0
7 Reading Use of a Relevant Language	17	2.0
8 Written Use of a Relevant Language	10	2.0
9 Decision Making on Methods	15	3.0
10 Decision Making on Quality	17	3.5
11 Figural Skills	3	1.0
12 Symbolic Skills	4	1.5
14 Implicative Skills	3	1.0
15 Financial Consequences of Error	15	1.0
16 Consequences of Error To Humans	19	5.5
11738000 Asepsis	2	1.5
12300000 Pharmacology	1	1.5
65620000 Mechanics of writing English	1	1.5

Figure 30. SKILL AND KNOWLEDGE REQUIREMENTS FOR UNASSIGNED TASK GROUPINGS[a] (continued)

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Name of Grouping: Machine Related and Housekeeping Tasks (18 Tasks)		Highest Necessary Scale Values for Group[c]
Category Name and Number[b] (Tasks 135,145,175,178,149,174, 70,2,268,72,269,267,223,69,222,144,146,273.)	Total Tasks	
2 Object Manipulation	17	3.5
4 Human Interaction	4	1.0
6 Oral Use of a Relevant Language	4	4.0
7 Reading Use of a Relevant Language	2	2.0
8 Written Use of a Relevant Language	1	2.0
9 Decision Making on Methods	13	1.5
10 Decision Making on Quality	12	3.5
11 Figural Skills	4	1.0
14 Implicative Skills	1	1.0
15 Financial Consequences of Error	14	1.0
16 Consequences of Error To Humans	15	2.0
11738000 Asepsis	7	1.5

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[a] Unassigned to any task factor by virtue of low factor loadings and/or unrelatedness to context of factor content.

[b] See Table A.1 for task descriptions. For fuller descriptions of category names see Tables A.2 and A.3.

[c] For descriptions of scales see Chapter 2.

LATTICE RELATIONSHIPS

The fact that there were 17 tasks which were retained on two task factors each suggests some likely possibilities for lattice relationships. The most obvious of these are the two diagonal movements from Factor Four, Level 2 to Factor Six's lowest point, Level 3, and from Factor Five, Level 2 to Factor Six, Level 3. Task 258 links Factor Four, Level 2 to Factor Six, Level 3. Since Factor Five,Level 3 and Factor Six,Level 3 share three tasks (143, 117 and 118), the diagonal rise to Level 3 of Factor Six from Level 2 of Factor Five seemed justified.

Figures 24 through 29 become the source of data which make it possible to compare the educational gaps between lattice movements. By comparing the skills and knowledges and levels required for a given target level in a task sequence with the skill and knowledge levels already attained in the potential source level,the required educational distance can be ascertained.

Figure 31 shows how such a comparison is made. The Figure compares the educational gap to reach Level 3 of Factor Six from an origin in Factor Four, Level 2 with the gap from an origin in Factor Five, Level 2. For each origin the Figure presents only the gaps. That is, it is assumed that any category or skill required for Factor Six,Level 3 (Figure 26) whose level has already been met by Levels 1 or 2 in the respective Factor of origin (Four or Five) will not be shown on Figure 31. What is

Figure 31. COMPARISON OF TRAINING GAPS RELATED TO TASK FACTOR LATTICES: DIAGONAL MOBILITY

Comparison: Factor Five, Level 2 to Factor Six, Level 3

Category Code Number and Name	Highest Level Reached	Level Now Needed
2 Object Manipulation	3.5	5.0
4 Human Interaction	5.0	7.0
6 Oral Use of a Relevant Language	4.0	7.5
8 Written Use of a Relevant Language	2.0	5.0
14 Implicative Skills	1.0	5.0
11731100 Regional anatomy	1.5	2.5
11733000 Pathology	1.5	2.5
11735400 Introductory procedures	1.5	2.5
11738000 Asepsis	2.5	3.5
5 Leadership	-	1.0
13 Taxonomic Skills	-	2.0
11731000 Normal structure and function	-	2.5
11731600 Digestive system	-	1.5
11731700 Urinary syst.,external genit.	-	2.5
11732220 Reproduction	-	3.5
11732221 Conception and contracept.	-	3.5
11732222 Male reproductive syst.	-	1.5
11732223 Female reproductive syst.	-	3.5
11733200 Neoplasms	-	1.5
11733600 Disorders of circ. syst.	-	1.5
11733900 Disorders of uro-genit.syst.	-	2.5
11800000 Microbiology	-	3.5
14128000 Separation methods in analys.	-	1.5
65620000 Mechanics of writing English	-	2.5

with: Factor Four, Level 2 to Factor Six, Level 3

Category Code Number and Name	Highest Level Reached	Level Now Needed
2 Object Manipulation	3.5	5.0
4 Human Interaction	5.0	7.0
16 Consequences of Error To Humans	5.5	7.0
11731100 Regional anatomy	1.5	2.5
11731700 Urinary syst.,external genit.	1.5	2.5
11732220 Reproduction	2.5	3.5
11738000 Asepsis	1.5	3.5
11731400 Circulatory system	-	1.5
11731600 Digestive system	-	1.5
11733600 Disorders of circ.system	-	1.5
11733700 Disorders of digest.system	-	1.5
11735400 Introductory procedures	-	2.5
11800000 Microbiology	-	3.5
14128000 Separation methods in analys.	-	1.5

Summary	Categories with Rise in Level	New Categories
Five (2) to Six (3)	9	15
Four (2) to Six (3)	7	5

shown is the increased levels for categories and any new categories to be taught in order to comply with the needs of Factor Six, Level 3.[3]

By comparing the two gaps related to the two origins it can be seen that more categories must be newly taught and more must be taught at a higher level in the movement from Factor Five than in the movement from Factor Four. All other things being equal, performers doing the tasks of Level 2 in Factor Four require a smaller training investment than those doing the tasks of Level 2 in Factor 5 to reach Level 3 of Factor Six.

Figure 32 presents summary data on several other possible lattice movements. In each case the data were arrived at in a manner similar to that described for arriving at Figure 31. The comparisons include alternative diagonal moves, the choice between diagonal and vertical moves, alternative lateral moves, and what appears to be downward lateral moves to enter Factors One and Two.

The data in Figure 32 indicate one overriding regularity, namely, the higher the level, the greater the number of categories to be taught at a higher level or as new categories. Comparisons 1, 2 and 5 deal with

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[3] It should be noted that the level could be lower in the Level of origin than needed, but an earlier level could have reached the level now required in the target Level, and there would be no gap for the category. It should also be noted that earlier levels than the target Level could have required higher scale values than that of the target Level, but the gap in the requirement for the lattice would reflect only the target Level. In the case of Figure 31, there was no earlier level, since Factor Six starts at Level 3.

Figure 32. COMPARISON OF LATTICE MOBILITY NEEDS

	Point of Origin: Factor and Level	Target: Factor and Level	Categories with Rise in Level	New Categories	Preferred Choice
1.	Factor Four, Level 2	Factor Six, Level 3	7	5	X
	Factor Five, Level 2	Factor Six, Level 3	9	15	
2.	Factor Five, Level 3	Factor Six, Level 4	15	27	about equal
	Factor Six, Level 3	Factor Five, Level 4	19	24	
3.	Factor Five, Level 3	Factor Six, Level 4	15	27	X
	Factor Five, Level 3	Factor Five, Level 4	35	21	
4.	Factor Six, Level 3	Factor Five, Level 4	19	24	X
	Factor Six, Level 3	Factor Six, Level 4	22	36	
5.	Factor Five, Level 4	Factor Six, Level 5	35	28	X
	Factor Six, Level 4	Factor Five, Level 5	45	44	
6.	Factor Five, Level 4	Factor Six, Level 5	35	28	about equal
	Factor Five, Level 4	Factor Five, Level 5	42	20	
7.	Factor Six, Level 4	Factor Five, Level 5	45	44	about equal
	Factor Six, Level 4	Factor Six, Level 5	45	41	
8.	Factor Five, Level 5	Factor Six, Level 5	10	10	X
	Factor Six, Level 5	Factor Five, Level 5	23	12	
9.	Factor Six, Level 5	Factor Two, Level 4	31	23	
	Factor Two, Level 4	Factor Six, Level 5	23	20	X
10.	Factor Five, Level 6	Factor One, Level 5	52	29	about equal
	Factor One, Level 4	Factor One, Level 5	58	21	

diagonal mobility. Each is at a higher level than before. There is an increasing number of categories to be dealt with at each level.

The movement from Factor Four to Factor Six (in comparison 1) is preferred over that from Five to Six. The movement from Factor Five, Level 3 to Factor Six, Level 4 (comparison 2) requires about the same education as its mirror image for Factor Six, Level 3 to Factor Five, Level 4. In the case of comparison 5, the distance from Factor Five Level 4, to Factor Six, Level 5 is shorter than its mirror image.

Comparisons 2 and 5 are shown contrasted with the alternative movement within the given factor. In the case of comparison 2, from Level 3 to Level 4, the two equal lattice movements are shorter than their counterpart vertical movements within factors (comparisons 3 and 4). This advantage in moving across factors no longer appears in going from Level 4 to Level 5. There is no appreciable difference in the educational distance between the vertical and the diagonal movements.

Comparison 8 indicates the relatively small training distance across factors at the same level when there is some task overlap. Tasks 41 and 50 appear at the same level in both Factors Five and Six. However, the movement from Five to Six remains shorter than that from Six to Five.

Comparisons 9 and 10 are presented to indicate the way into Factors Two and One. It is necessary to move downward in level from one of the four narrower,multi-level factors to enter the two broad professional-level factors. In the case of comparison 9, there is the possibility of a reverse movement from Factor Two, Level 4 to Factor Six, Level 5, with only one level left to be reached in Factor Six. This latter movement entails less education than the movement from Factor Six to Factor Two.

Factor One seems approachable through Level 5. Task 28 is present at that level and in Factor Five, Level 6. The distance from Factor Five to Factor One is contrasted with the vertical distance within Factor One from Level 4 to Level 5 (since the movement from Factor One to Factor Five is not likely). The educational distances are about the same, even though there is a downward, diagonal movement in the lattice as compared with a vertical movement in the ladder. The breadth of Factor One accounts for the discrepancy.

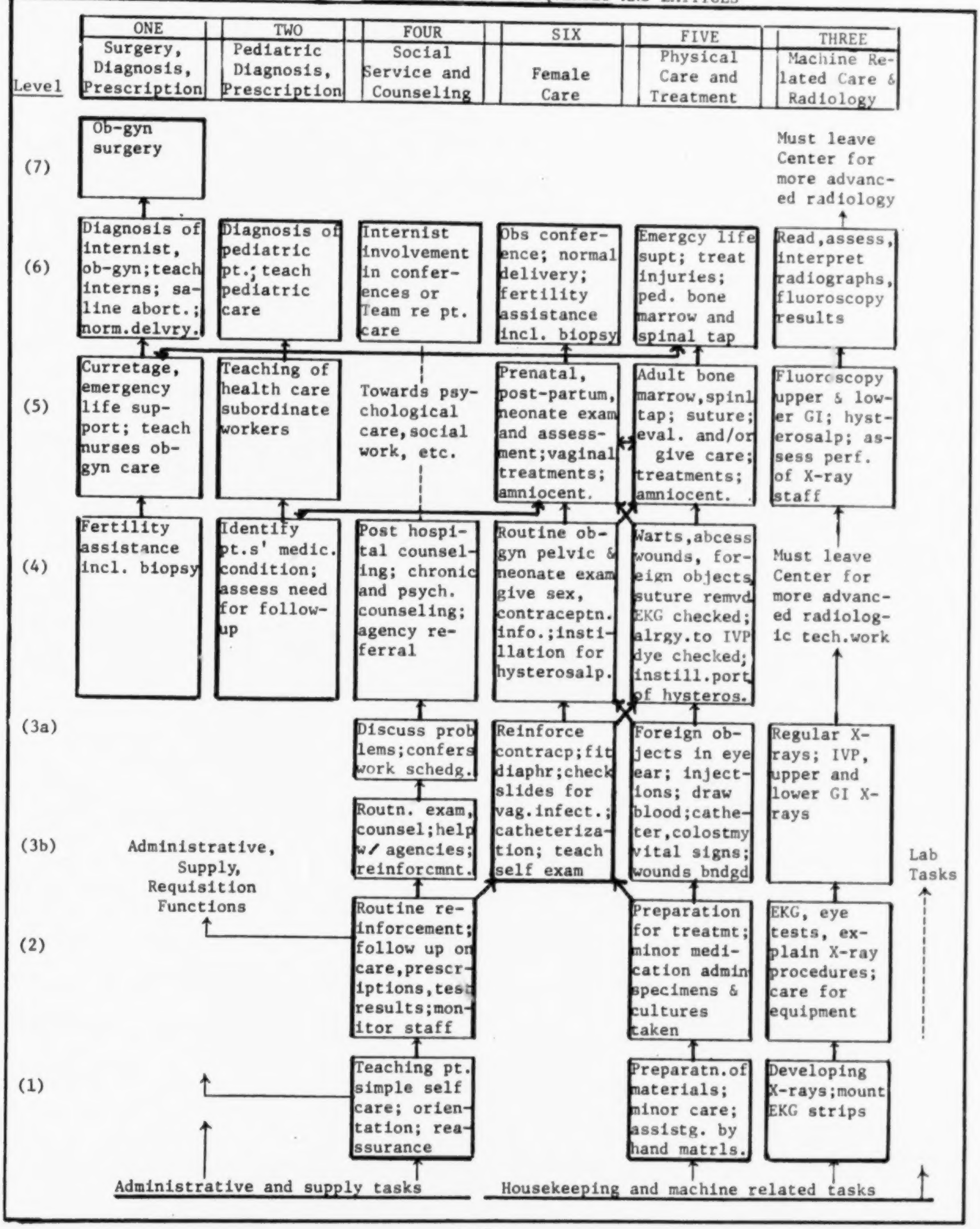
The analysis thus indicates that lattice as well as ladder movements are realistic,and that their relative educational efforts can be compared. This means that specialized, flexible educational programs can be designed using the task data for the initial analysis.

Figure 33 represents a graphic summary of the work discussed so far. In it the task content of the various levels are summarized, and the lattice possibilities are shown.

CURRENT EDUCATIONAL LOCATIONS

The foregoing sections of this chapter dealt with general educational levels for task sequences. This section presents the task sequences along with data indicating where the training of the tasks might now be

Figure 33. GRAPHIC SUMMARY OF TASK SEQUENCES AND LATTICES



Level	ONE Surgery, Diagnosis, Prescription	TWO Pediatric Diagnosis, Prescription	FOUR Social Service and Counseling	SIX Female Care	FIVE Physical Care and Treatment	THREE Machine Related Care & Radiology
(7)	Ob-gyn surgery					Must leave Center for more advanced radiology
(6)	Diagnosis of internist, ob-gyn; teach interns; saline abort.; norm.delvry.	Diagnosis of pediatric pt.; teach pediatric care	Internist involvement in conferences or Team re pt. care	Obs conference; normal delivery; fertility assistance incl. biopsy	Emergcy life supt; treat injuries; ped. bone marrow and spinal tap	Read, assess, interpret radiographs, fluoroscopy results
(5)	Curretage, emergency life support; teach nurses ob-gyn care	Teaching of health care subordinate workers	Towards psychological care, social work, etc.	Prenatal, post-partum, neonate exam and assessment; vaginal treatments; amniocent.	Adult bone marrow, spinl tap; suture; eval. and/or give care; treatments; amniocent.	Fluoroscopy upper & lower GI; hysterosalp; assess perf. of X-ray staff
(4)	Fertility assistance incl. biopsy	Identify pt.s' medic. condition; assess need for follow-up	Post hospital counseling; chronic and psych. counseling; agency referral	Routine ob-gyn pelvic & neonate exam give sex, contraceptn. info.; instillation for hysterosalp.	Warts, abcess wounds, foreign objects, suture remvd EKG checked; alrgy. to IVP dye checked; instill. port of hysteros.	Must leave Center for more advanced radiologic tech. work
(3a)			Discuss problems; confers work schedg.	Reinforce contracp; fit diaphr; check slides for vag. infect.; catheterization; teach self exam	Foreign objects in eye ear; injections; draw blood; catheter, colostmy vital signs; wounds bndgd	Regular X-rays; IVP, upper and lower GI X-rays
(3b)	Administrative, Supply, Requisition Functions		Routn. exam, counsel; help w/ agencies; reinforcmnt.			
(2)			Routine reinforcement; follow up on care, prescriptions, test results; monitor staff		Preparation for treatmt; minor medication admin specimens & cultures taken	EKG, eye tests, explain X-ray procedures; care for equipment
(1)			Teaching pt. simple self care; orientation; reassurance		Preparatn. of materials; minor care; assistg. by hand matrls.	Developing X-rays; mount EKG strips

Lab Tasks
Administrative and supply tasks
Housekeeping and machine related tasks

found. This part of the chapter is to be considered indicative. The data come from the curriculum work described at the end of Chapter 2. Only one program for each educational type was sampled, and the respondents dealt only with the task names. They responded to their concept of what is needed to teach persons so that they can carry out the tasks. (The reader is directed to Chapter 2 and Appendixes B.1 and B.2 for a review of the methodology involved.)

Figures 34 through 40 show the names of the tasks of each of the task factors or task groupings in very abbreviated form for the sake of space. (The respondents were presented with the document shown in Appendix B.1.) Next to each task title(s), the current performer in the pilot test is listed. The next seven columns on the right stand for the six educational programs consulted. The column marked "C" stands for the Center's own training department. Next to each task is entered the letters A, B, or C if any of these were chosen by the respondent of the given program. These letters stand for given degrees of the curriculum content represented in the task which is said to be covered by the program.

In the case of the Center, there were three programs (Nurse Practitioner, Family Health Worker, and Medical Assistant). The highest letter chosen, regardless of the title of the program, appears in the Figures even when the title of the performer does not match the title of the program. The reason is that these Figures deal with the institutional location of the curriculum contents represented by the tasks rather than the titles.

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The Figures are presented for the possible light they might shed or the insights that might be gained about current health manpower education.

Factor One

Factor One is presented in Figure 34. This Figure indicates that much professional level work is taught after medical school. The surgery tasks seem to be covered later as are the other tasks involving a "laying on of hands." It is interesting to note, however, that the medical school claims to fully teach the diagnostic tasks.

Factor Two

Factor Two has a pattern similar to that of Factor One with regard to the professional level tasks. Figure 35 suggests that the medical school teaches diagnostics, but not necessarily how to teach (task 27). The Nurse Practitioner tasks are echoed in the RN Baccalaureate program and are also covered by the medical school.

Factor Three

Inspection of Figure 36 suggests that the Radiologist is prepared outside of medical school, but that physicians learn how to read X-rays in medical school. The tasks of EKG are apparently covered only at the upper and the lower levels. The medical student and the performer hired for the job both learn EKG tasks, but nursing programs and radiologic programs do not seem to cover them. On the other hand, the reading of EKG's is dealt with at varying program levels.

Figure 34. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR ONE, SURGERY, DIAGNOSIS AND PRESCRIPTION SPECIALTY

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
47	Surg.excision of uterus,ovaries: hysterectomy through abdomen or vagina.	OB-GYN				C			C
49	Ligation of fallopian tubes.	OB-GYN							C
48	Vag.plastic surg. or correc. vag.hernia.	OB-GYN				C			C
44	Cesarean section delivery.	OB-GYN							C
21	Informal instr. of interns,res.in pt.care	INT	not in questionnaire						
46	Saline abortion.	OB-GYN	C						C
43	Delivery of baby through vagina.	OB-GYN				C		C	A
9	Diag.med.cond;decidg.care, non-child pt.	INT	B			C			A
39	Diag.ob-gyn cond.,decidg.,care,(fem.pt.)	OB-GYN	B			C		C	A
10	Decidg whether to proceed with care, administer medication to non-child pt.	INT	B	C		B		A	A
45	Currettage abortion.	OB-GYN							C
40	Decidg.wheth.to adm.or change med fem.pt.	OB-GYN	B	C		B			A
53	Instructg. nurses in ob-gyn pt. care.	OB-GYN	not in questionnaire						
28	Emergency life support care.	INT PED	B	B		A	C	A	B
42	Providg fertility assist. for female pt.	OB GYN	C				C	B	B

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; MEdical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 35. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR TWO, PEDIATRIC SPECIALTY IN DIAGNOSIS AND PRESCRIPTION

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
55	Diagnosing health, development; deciding care for pediatric patient.	PED	B			C		B	A
63	Lectures, tests for Nurse Pract.; delegation of duties considered.	PED	C					C	
64	Informally training Nurse Pract.; delegation of duties considered.	PED	not in questionnaire						
56	Deciding whether to go ahead with pediatric care and administer medication.	PED	B	C		B		A	A
27	Lectures to staff and students on health and medical subjects.	INT OB-GYN	B	C		C		A	C
29	Informally instructing subordinates in patient care.	INT PED	not in questionnaire						
123	Instructing Family Health Workers or Nurse-interns in patient care.	NP	not in questionnaire (see task 27)						
120	Preparing, presenting classes for Family Health Workers; evaluating students.	NP	C					C	
88	Identifying juvenile's health condition.	NP	A			B			A
83	Identifying obvious medical condition of adult and follow-up on care.	NP	A			C		A	A
24	Assessing urgency of follow up for no-show patients.	INT OB-GYN PED	not in questionnaire						

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 36. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR THREE, SPECIALTY IN MACHINE RELATED CARE AND RADIOLOGY

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MA
6	Readg.,assessg X-ray:makg recommendations.	RAD			C				B
8	Answering MD questions about radiographs.	RAD	not in questionnaire						
1	Fluoroscopy of lower intestinal tract.	RAD			C				
3	Fluoroscopy of upper GI tract.	RAD			B	C			
4	Fluoros.portion of hysterosalpyngography.	RAD			C				
7	Assesg.performce,output,of X-ray workers.	RAD	not in questionnaire						
20	Reading and interpreting "stat" X-rays on request.	INT PED			C				B
68	Preparing pt. and barium drink for fluoroscopy and taking upper GI X-rays.	X-ray			A				C
67	Taking lower GI series X-rays, scout film.	X-ray			A				
65	Takg.X-rays with vert.or table X-ray mach.	X-ray			A				
66	Taking IVP X-rays after allergy test.	X-ray			A				
81	Assessing quality of radiographs.	X-ray			A				A
73	Reassuring pt. about X-ray procedures.	X-ray	not in questionnaire						
74	Re-explaing.pre-X-ray home procedures.	X-ray	not in questionnaire						
262	Preparing pt.; taking electrocardiogram.	EKG	A			C			A
270	Demonstratg.and instructg.;taking EKG.	EKG	A			C			A
257	Givg.vision tests (Keystone,Snellin).	MA-U	B			C			C
99	Administering Snellin eye test.	NP	B			A			A
82	Calling repair company re X-ray equipment.	X-ray	not in questionnaire						
79	Preparing barium enema.	X-ray			A				
132	Checking and caring for equipment.	LPN-U LPN-E	B	C		A	C		
271	Deciding if EKG reading looks suspicious.	EKG	C			A		A	A
71	Developing radiographs using hand developer.	X-ray DRA			A				
78	Preparg.radiograph packet for interpret.	X-ray	not in questionnaire						
263	Cutting and mounting an EKG strip.	EKG	A						
272	Checkg.level of developer, fixer solution.	DRA			A				

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[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Factor Four

It appears from Figure 37 that much of the counseling done by the Nurse Practitioner is taught at the BA level in nursing and also in the medical school. The social service and reinforcement functions of the Family Health Worker appear in the BA nursing program.

The indication is that the training for many of the other tasks could be duplicated across educational levels. It cannot be completely clear until actual curriculum content is analyzed. Since this factor reflects a good deal of emphasis on Decision Making on Methods and on Quality, varying levels for the same overall task names could be involved.

Factor Five

Factor Five is the Physical Treatment factor. As Figure 38 indicates, all of the tasks of the factor were represented in the questionnaire. It is interesting to note that, among the 24 tasks of the three upper levels, only nine are accounted for with an A at medical school; eight have an A at the BA-RN level; six have an A at the Diploma-RN level; and three are covered at the Center.[4] Taking bone marrow, response to cardiac arrest, amniocentesis, suturing, vaginal treatments, removal of warts, testing for IVP-dye allergy, incising and draining abscesses, removal of objects from the pharynx, and the instillation portion of the hysterosalpyngography are all unaccounted for with an A by any of the programs.

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[4] "A" refers to coverage of all or most of the content needed for the task.

Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY

p. 1 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
25	Particip.in Family Health Team conf.as Int.	INT	not in questionnaire						
90	Post-hosp.visit to chronic schizophren.pt.	NP	B			C		A	A
125	RN committee work on health procedures.	NP	not in questionnaire						
121	Particip.in Family Health Team conf.as NP.	NP	not in questionnaire						
114	Pragmatic counselg.for pt. on pers.probs.	NP	A	C		B	C	A	A
101	Counseling in sex,contracept.,VD,abortion.	NP	A	C		C	C	A	A
102	Chronic or special care procedures for daily living reinforced or explnd.to pt.	NP	B	B		B	B	A	A
115	Deciding on and arranging referral of patient to agency.	NP	A	C		B		A	
110	Answering pt.'s quest.on care at RN level.	NP	not in questionnaire						
236	Discussg.pers.,soc.,health probs.with pt.	FHW	A	B		A	C	A	B
26	Participating in committees at institution.	INT PED	not in questionnaire						
239	Particip.in Fam.Health Team conf. as FHW	FHW	not in questionnaire						
127	Work scheds.planned and approved re pts.	NP	not in questionnaire						
23	Filling in forms and letters describing patient's medical condition for institutions.	INT OB-GYN PED		C		A		A	A
111	Safety inspection of patient's home.	NP	B	B		B	B	A	A
241	Providg.job orient.to new co-worker FHW.	FHW	not in questionnaire						
219	Accompanying pt. to any social agency.	FHW	not in questionnaire						
122	Coordinating multi-agency exams for pt.	NP	not in questionnaire						
252	Conductg.routine exam of chron.disease pt.	FHW	A			A	C	A	A
148	Answer pt.'s phone quest.at LPN capability	LPN-U	not in questionnaire						
154	Participating in Unit conf. as LPN.	LPN-U	not in questionnaire						

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Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY (continued)
p. 2 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
249	Conducting routine post partum exam.	FHW		B		A	A	A	A
203	Reinforcing diet and making ethnic substitutes.	LPN-U FHW	B	B		A	B	A	A
158	Informally evalg.,teachg.subord.Med.Assts.	LPN-U	not in questionnaire						
237	Discussg.consum.protect.;helpg.w/budget.	FHW	A	B		C		A	
245	Orientg.,takg.intake info.from new family.	FHW	A			B		B	C
226	Givg.basic sex ed.,contracept.,abort.info.	FHW	A	C		B		A	C
100	Giving Denver Development test for child.	NP	A						C
246	Reviewing intake information on family, assessing priority of problems.	FHW	A			C		C	B
159	Follow up on no-show pt.,arrangg.new apt.	LPN-U	not in questionnaire						
238	Decidg.pt. needs homemkg.services; doing.	FHW	A	B		B	C	A	C
202	Give intro.info.on brth.con.meth.on ords.	LPN-U	A			B	C	A	B
124	Checkg. assessg.subords'.attendance.	NP	not in questionnaire						
197	Reinforcg.prescribed diet, medication.	LPN-E	A	A		A	A	A	C
228	Teachg.TB pt.& family proper health practs.	FHW	B	B		A	A	A	C
221	Makg.oral present.on good hlth. practs.	FHW	B	B		A		A	B
255	Contribg.opinion at Unit conf.as Med.Asst.	MA-U	not in questionnaire						
258	Reinforcg.pt. in use of contraceptive.	MA-U	A			B	C	A	B
240	Decidg,arrang. apt.for pt.at Center.	FHW	not in questionnaire						
131	Assigning staff to treatment rooms.	LPN-U LPN-E	not in questionnaire						
261	Answerg. phone in Unit; takg. message.	MA-U	not in questionnaire						
253	Follow up on pt.discharged from hospital.	FHW	A	C		A		A	B
94	Assessing tine test after time lapse and following up on results.	NP	A			A	B	A	A
77	Monitorg.functions,work of X-ray dept.	X-ray	not in questionnaire						
234	Deliver med.to pt.,exp.how to take as ord.	FHW	not in questionnaire						
259	Taking partial history from patient.	MA-U	A			B		B	C
107	Teach pt.self exam,care of breasts.	NP	B			A	A	A	B
116	Deciding whether to provide patient with transportation.	NP FHW	not in questionnaire						
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U MA-U	A	A		A	A	A	A
247	Dec.wheth.fam.tht.mvd.stays w/Fam.H.Team.	FHW	not in questionnaire						
204	Providing orientation tour of facilities and procedures at Center.	LPN-U FHW	not in questionnaire						
211	Teachg. how to bathe and diaper infant.	FHW	A	A		A	A	A	C
254	Plang.a weekly work schedule for approval.	FHW	not in questionnaire						
215	Teaching how to prepare infant formula.	FHW	A	C		A	C	A	C
126	Aprove,change requisition forms of subord.	NP	not in questionnaire						

Figure 37. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES:
FACTOR FOUR, SOCIAL SERVICE AND COUNSELING SPECIALTY (continued)
p. 3 of 3

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
113	Giving general reassurance to any patient.	NP LPN-U LPN-E FHW MA-U	not in questionnaire						
216	Teachg.bottle feedg.,burping to new mother.	FHW	A	A		A	A	A	B
106	Teachg. pt. postural drainage technique.	NP	C	B		A	A	A	C
225	Checkg.pt.'s med.;hvg.old ones discarded.	FHW	A	C		A		A	B
208	Collectg. stool spec.; taking to lab.	FHW	not in questionnaire						

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Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
28	Emergency life support care.	INT PED	B	B		A	C	A	B
37	Treatment of injuries.	INT PED	C	C		B		B	A
60	Spinal tap from pediatric patient.	PED				B			A
62	Bone marrow sample from pediatric pt.	PED				B			B
22	Respond to card.arrest call; providg.care.	INT	C		C	B			B
50	Takg.sample of amniot.fluid from preg.pt.	OB-GYN				B			C
30	Spinal tap from adult patient.	INT				B			A
32	Suturing lacerations.	INT PED		C		C			B
41	Cauterizg; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	B			C			C
61	Drawing blood from pediatric pt.'s vein.	PED	C			B			A
91	Administering first aid in emergency.	NP FHW	B	C	C	A		A	B
31	Bone marrow specimen from adult patient.	INT				B			B
87	Evaluating or following routine prescribed treatment or care.	NP	C			C	C	A	A
12	Removing a wart from non-child patient.	INT							B
17	Determining if suspect EKG reading is true or artifact.	INT PED				C		A	B
19	Determining allergy to dye for IVP X-rays.	INT			C				C
34	Incising and draining abcess or boil.	INT PED				C			B
59	Removing large blunt object from pharynx.	PED		C		C			C
33	Removing sutures.	INT OB-GYN PED	B			C			A

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[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES:
FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
p. 2 of 4

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
250	Conducting routine neonate examination.	FHW	A	C		A	B	A	A
13	Setg.up,teachg.IV apparat.,non-child pt.	INT	C	C		A	B	A	A
5	Instill.portion of hysterosalpyngography.	RAD			C				C
105	Irrigatg,dressg.bandag.,wound,burn.	NP	A	A		A	A	A	A
171	Assessg. urgcy. for MD to see emerg. pt.	LPN-E	A	B		A	C	A	B
38	Remove foreign object from eye and/or ear.	INT				B		B	B
18	Drawing blood from non-child patient's vein.	INT NP	B			A			A
112	Teachg.diabetic med.or insulin injection.	NP	A	A		A	A	A	A
156	Cleaning, dressing, bandaging wounds as ordered.	LPN-U LPN-E	A	A		A	A	A	A
192	Assistg.in emergency by preparg.materials.	LPN-E	A	B		A	C	B	
167	Prepg.,admin.subcut.,intramus.inject on ord	LPN-E	A	A	C	A	A	A	B
133	Preparg.,admin.,explain subcutaneous or intramuscular injection as ordered.	LPN-U	A	A	C	A	A	A	B
251	Conducting routine exam of any pt. over six months of age.	FHW	A	C		B	C	A	A
57	Removg.foreign object from pt.'s ear.	PED				B		A	B
117	Irrigatg.and changg.indwelling catheter.	NP	B	C		A	A	A	B
143	Obtaining urine specimen from female using catheter.	LPN-U LPN-E	C	A		A	A	A	
92	Removing thread stitches if appropriate.	NP	B			C			A
119	Teachg.infant's formula,feedg.bathg.diaperg	NP	A	B		A	B	A	C
243	Takg,recordg.vit.signs;notify MD of abnorm.	FHW	A	C		B	C	A	A
232	Help any pt.needing assistance in walking.	FHW	A	A		A	A	B	
118	Teaching pt. irrigation of catheter.	NP	B	C		A	A	A	B
58	Preparing patient with foreign body in eye by applying dye strip.	PED	C			B		A	C
104	Admin.common range of motion exerc.on ord.	NP	B	C		A	A	B	B
109	Teachg.irrigation,change,care of colostomy	NP	A	B		A	A	A	C
218	Bandaging or changing bandage for minor wound as ordered.	FHW MA-U	A	A		A	A	A	A
191	Applying splint on orders.	LPN-E	C	C		A		A	B
179	Preparing intravenous bottle.	LPN-E	B	C		A	B	A	B
229	Chang. colostomy bag, irrigatg.on orders.	FHW	A	B		A	A	A	C
152	Administering prepacked smallpox vaccine on orders	LPN-U LPN-E	B			A		A	A
185	Assistg. in administ.of oxygen on orders.	LPN-E	B	B		A	C	A	C
210	Bathing any adult bedridden patient.	FHW	A	A		A	A	A	
215	Teaching how to prepare infant formula.	FHW	A	C		A	C	A	C
206	Examing,treatg.bedridden pt.for bed sores.	FHW	A	A		A	A	A	B

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
163	Preparg.materials for special procedures.	LPN-U	A	C	A	A	C	A	
224	Decidg.to make an occupied bed and making.	FHW	A	A		A	A	A	
173	Preparing patient for suturing.	LPN-E	A	A		A	B	A	A
244	Teachg.temp.taking,care of thermometer.	FHW	A	B		A	B	A	B
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U LPN-E MA-U	A	B	B	B	B	A	B
93	Applying prepackaged tine test for TB.	NP LPN-U LPN-E FHW MA-U	B			A	C	A	A
200	Applying hot or cold compress on Dr.'s orders.	LPN-U FHW	A	A		A	A	A	B
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U MA-U	A	A		A	B	A	C
162	Irrigating ear with solution as ordered.	LPN-U LPN-E MA-U	A	B		A	A	A	C
142	Administering rectal medication as ordered.	LPN-U LPN-E	B	B		A	A	A	
95	Tablet or dipstick urine test.	NP LPN-U LPN-E FHW MA-U	B	A		A	A	A	A
96	Taking throat culture specimen; labeling.	NP LPN-U LPN-E FHW MA-U	A	B		A	B	B	A
205	Giving pt. enema on doctor's orders.	FHW	A	A		A	A	A	C
190	Assisting pt. to or from wheelchair.	LPN-E FHW	A	A	C	A	A	A	
194	Administerg. eye or ear drops on orders.	LPN-E	A	A		A	A	A	A
233	Teachg.pt.how to irrigate eye with water.	FHW	B	A		A	B	A	C
177	Treatg. pt.for ringworm on Dr.'s orders.	LPN-E	A	B		A	A	A	C
188	Applying cold towels or ice bath to patient for fever on orders.	LPN-E	A	A		A	B	A	C
209	Givg.alc.bath for fev.;report if no effct.	FHW	A	A		A	B	A	C
212	Assistg.any non-inf.pt.to bathe or shower.	FHW	A	A		A	A	A	
195	Applying eye patch on orders.	LPN-E	A	B		A	A	A	
187	Giving oral medication to patient.	LPN-E	B	C		A	A	A	B

Figure 38. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR FIVE, PHYSICAL CARE AND TREATMENT SPECIALTY (continued)
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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location						
			C	LPN	X	D-RN	A-RN	B-RN	MD
189	Treatg.pt.for lice on orders by shampooing.	LPN-E	A	A		A	B	A	C
256	Adming.prepacked polio vaccine on orders.	MA-U	B	C		A	A	A	B
161	Weighing and measuring patient and recording.	LPN-U LPN-E MA-U	A	B		A	A	A	A
170	Assisting patient in dressing.	LPN-E	A	A	A	A	A	A	
198	Admin.oral med.,expl.effects on Dr.'s ord.	LPN-U	B	C		A	A	A	B
217	Preparg.food,feedg. non-infant patient.	FHW	B	A		A	A	A	C
213	Treating baby for cradle cap.	FHW	A	C		A	A	A	
166	Assembling suture materials as ordered.	LPN-E	A	A		A	B	B	
260	Preparing hypodermic on orders.	MA-U	A	A	C	A	A	A	C
180	Prepg.tray for drawing blood;writg.labels.	LPN-E	A	C	A	A	C	A	
181	Preparing tray for nasal packing.	LPN-E	A	C	A	A	C	A	
153	Assisting Dr. in medical exam with materials.	LPN-U MA-U	A	C	A	A	C	A	
193	Preparg.for bone marrow punct.on orders.	LPN-E	B	B		A	A	B	
183	Inducg.vomiting in pt.on Dr.'s ord.w/med.	LPN-E	A	A		A	A	B	
182	Preparg.pt.for gastric lavage,assisting.	LPN-E	A	A		A	A	A	
214	Shampooing patient with itchy scalp.	FHW	A	A		A	B	A	C

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

It is interesting to note that these tasks factor together with other treatment tasks that are taught, and stand in hierarchical relation to other tasks which essentially involve Introductory Procedures. The suggestion is that diagnosis, which does not involve operational touching of the patient aside from examining him, is accounted for by medical school, and many treatment tasks which involve great immediate danger to the patient are not. However, since these latter tasks are heavily dependent on practice for their successful performance, it would seem warranted that specialties in such activities be developed which would provide early and continued clinical practice. Inspection of the other tasks of Factor Five suggest where to look for the candidates for these professional-level specialties. Throughout the nursing line the performers are called upon to "lay hands" on the patient, and a familiarity with such contact is built up out of long clinical experience. The conclusion is obvious. These are the sources for the specialties -- not that these performers are now ready, but that they could be made ready most efficiently with the proper educational sequences.

Factor Six

Comments similar to those dealing with Factor Five apply to Factor Six, to the extent that Factor Six includes several "treatment" tasks. In addition, several of the tasks of this factor are now taught in the medical school, but not in the other programs, while their actual level on the factor suggests that they could be taught earlier in an educational sequence. Tasks 15, 16 and 51, which involve inspection of slides for the presence of infectious organisms, are such tasks. (See Figure 39.)

Figure 39. CURRENT EDUCATIONAL SOURCES FOR TASK SEQUENCES: FACTOR SIX, SPECIALTY IN FEMALE CARE

Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
54	Participating in Ob-gyn physician conf.	OB-GYN	not in questionnaire						
52	Contributg.to Fam.Health Team as Ob-gyn.	OB-GYN	not in questionnaire						
43	Delivery of baby through vagina.	OB-GYN				C		C	A
42	Providg.fertility assist.for female pt.	OB-GYN	C				C	B	B
86	Prenatal exam of preg.pt.;reportg.abnorm.	NP		C		B	B	B	A
85	Providg.post-partum exam;evaluatg.cond.	NP		B		A	B		A
89	Assess condition of neonate, follow-up.	NP	A	C		A		A	A
50	Takg.sample of amniot.fluid from preg.pt.	OB-GYN				B			C
41	Cauterizg; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	OB-GYN	B			C			C
248	Conducting routine prenatal exam.	FHW				B	C	A	C
101	Counselg. in sex,contracept.,VD,abortion.	NP	A	C		C	C	A	A
84	Performing pelvic exam on adult female including specimens and follow-up.	NP	A	C		B			A
5	Instill.portion of hysterosalpyngography.	RAD			C				C
11	Routine pelvic exam on adult fem. pt.	INT	A	C		B			A
202	Givg.intro.info.on birth control on ords.	LPN-U	A			B	C	A	B
226	Givg.basic sex ed., contracep.,abort.info.	FHW	A	C		B		A	C
250	Conductg. routine neonate examination.	FHW	A	C		A	B	A	A
258	Reinforcg.pt.in use of contraceptive.	MA-U	A			B	C	A	B
249	Conductg. routine post-partum exam.	FHW		B		A	A	A	A
103	Measurg., fitg.diaphragm for female pt.	NP	A			C		A	B
51	Determine pres.of monilia fungi on slide.	OB-GYN							A
16	Examining a slide for gonococci.	INT PED							A
143	Obtaing.urine specimen from female using. catheter.	LPN-U LPN-E	C	A		A	A	A	
15	Determining presence of trichomonas on slide.	INT OB-GYN PED							A
117	Irrigatg,changg.indwelling catheter.	NP	B	C		A	A	A	B
118	Teachg. patient irrigation of catheter.	NP	B	C		A	A	A	B
107	Teachg. pt. self exam, care of breasts.	NP	B			A	A	A	B

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Unassigned Tasks

The unassigned tasks indicate a good deal of overlap across educational programs, much of which is not warranted. Inspection of Figure 40 suggests that, aside from the laboratory tasks (which should be taught at lower levels and are not),much routine specimen taking, testing and preparation of materials is taught at many levels. The reason, of course, is that these curricula are not and never were designed to be continuous sequences. The apparent overlap is justified only when each program must be complete unto itself.

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
	LABORATORY RELATED TASKS								
36	Examining blood slide.	INT PED				C			A
14	Evaluating a skin specimen slide for fungi.	INT PED							A
35	Examining spun-down urine sediment and supernate.	INT PED	C			B			A
139	Assessing results of tine test.	LPN-U LPN-E FHW MA-U	A			A	B	A	A
207	Testing plaster in home for lead; reporting positive finding.	FHW	A						C
172	Taking stool specimen:testing for blood.	LPN-E	C	C		A			A
141	Testing stool specimen for blood using tablet.	LPN-U MA-U	C	C		A			A
98	Obtaining clean catch urine specimen.	NP LPN-U LPN-E MA-U	A	A		A	A	A	B
108	Teaching patient reagent or dipstick urine test.	NP	B	A		A	A	A	A
140	Teaching how to do urine test using tablet.	LPN-U MA-U	B	A		A	A	A	A
155	Obtaining urine specimen; preparing for lab.	LPN-U MA-U	not in questionnaire						
97	Teaching or collecting specimen for pinworm test.	NP	A			A			A

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS (continued)

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b]						
			C	LPN	X	D-RN	A-RN	B-RN	MD
	LABORATORY RELATED TASKS (continued)								
147	Preparing patient for pelvic exam; preparing slides.	LPN-U LPN-E MA-U	A	C		A	B	B	
196	Giving patient enema kit and instructions for use.	LPN-E	not in questionnaire						
	MISCELLANEOUS TASKS								
80	Preparing materials for IVP-dye allergy test.	X-ray			A	C		B	A
230	Preparing materials for use in a catheter irrigation.	FHW	A	C	A	A	C	A	
	MACHINE RELATED AND HOUSEKEEPING TASKS								
135	Readying treatment room by wiping up and cleaning.	LPN-U LPN-E MA-U	B	C		A	C		
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	A	B	C	C			
175	Preparing equipment for autoclave by wrapping.	LPN-E	A	B	C	C			
178	Wrapping sterile equipment removed from sterilizer.	LPN-E	A	C	C	C	C		
149	Sterilizing equipment in hot water sterilizer.	LPN-U MA-U	A	C	C	C	C		
174	Washing and placing equipment in sterilizer.	LPN-E	A	C	C	C	C		
70	Preparing hand developing tank for X-ray film.	X-ray DRA			A				
2	Loading or unloading film in fluoroscopy machine.	RAD	none of programs						
268	Checking EKG paper and putting in a new roll.	EKG	B						A
72	Loading X-ray film cassettes.	X-ray DRA			A				
269	Deciding repair is needed for EKG machine.	EKG DRA	not in questionnaire						
267	Routine cleaning and dusting of machines.	EKG DRA	not in questionnaire						
223	Deciding to make an empty bed and making.	FHW	A	A		A	A	A	

Figure 40. CURRENT EDUCATIONAL SOURCES FOR SELECTED TASK GROUPINGS UNASSIGNED TO FACTORS (continued)

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Task Code No.	Abbreviated Name of Task	Current Titles[a]	Curriculum Location[b] C	LPN	X	D-RN	A-RN	B-RN	MD
	MACHINE RELATED AND HOUSEKEEPING TASKS (continued)								
69	Using automatic developer for X-ray and spot films.	X-ray DRA			A				
222	Duplicating forms on duplicating machine.	FHW	not in questionnaire						
144	Preparing hot water sterilizer for use.	LPN-U	A	C	C	C	C	C	
146	Setting autoclave.	LPN-U MA-U	A	B	C	C			
273	Turning on X-ray film developing machine.	DRA	not in questionnaire						

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] C = Center; LPN = LPN Program; X = Radiologic Technician Program; D-RN = Diploma RN Program; A-RN = Associate Degree RN Program; B-RN = Baccalaureate RN Program; MD = Medical School. Within columns, C = covers small amount of curriculum content; B = covers significant amount; A = covers all or most of curriculum content needed for task.

Note: Administrative tasks and most Inventory and Supply Related tasks were not in the questionnaire because their curriculum contents are obviously specific to the institution.

CHAPTER 5

PRACTICAL RESULTS OF PILOT TEST FOR IMMEDIATE CENTER USE

The pilot test was not only a test of the methodology; the specific content of the work is of relevance to the Dr. Martin Luther King, Jr. Health Center. The uses to which the results can be put are of three types: (1) recommendations that can be applied immediately without major restructuring of the jobs; (2) recommendations that require major restructuring of the jobs; and (3) recommendations that require a major rethinking of the role of the Family Health Team, as well as a major restructuring of jobs. Curriculum implications accompany each.

This chapter presents an analysis of the jobs studied at the Center and recommendations that can be applied to the jobs and to curricula without major reorganization. (Chapter 6 deals with type 2 recommendations and Chapter 7, on policy, includes a section on type 3 considerations.)

This chapter assumes that all the tasks which were identified in the pilot test are to be continued at the Center, and that no major additions or deletions of tasks is contemplated. It is known that some reassignment of tasks has taken place since the pilot test, but these are primarily the creation of a Nurse Coordinator whose functions involve the management and coordination of the Teams, and the use of Managers for each Unit at the Center.

Given the basic assumption listed above, the task data make it possible to examine the overall structure of jobs with respect to overlap tasks,and the levels of tasks in relation to the level of the titles in which the tasks appear. The data can point to the most likely job ladder possibilities, given the current titles and salary relationships.

This chapter also pinpoints several discrepancies in task or curriculum content at the Center and reports on the pilot test examination of curriculum overlap. It notes evidence warranting advanced standing in credentialed programs.

JOB TITLES AND OVERLAP

Theoretically, tasks which are adequately performed in lower-level job titles, or can be adequately performed at lower levels, are misallocated when they are also done by persons in upper-level titles. If an institution wishes to make better use of scarce and expensive upper-level manpower resources ,such data are of relevance.

The HSMS task definition makes it possible to identify true task overlap and to avoid confusing overlap of elements with overlap of whole tasks. The importance of the overlap data for the Dr. Martin Luther King, Jr. Center is less due to acute shortages (although there is some scarcity of physician time) and more because of pressure to reduce operating costs. Misallocation of tasks can be expensive. The advantage of having overlap data is that, given acceptable performance of the tasks in currently overlaped titles, there is a *prima facie* argument for downward assignment of overlap tasks to the lower salary levels.

Overview

Figure 41 presents a summary of the task overlap data for the titles studied. (The two LPN titles are combined.) The titles are presented in descending order by maximum annual salary, and from left to right in the same order. Inspection of the Figure permits the reader to find the number and percentage of overlap tasks for each title and for the titles which share the overlaps.

There seems to be no overall problem of overlap; the overlap of tasks appears to be concentrated between pairs of titles. For example, overlap between the Internist and Pediatrician accounts for 53 percent of the Internist's tasks and 62 percent of the Pediatrician's tasks. The Nurse Practitioner has 17 percent task overlap with the Family Health Worker; the X-ray Technician has a 22 percent overlap with the Dark Room Aide; the LPN's overlap 31 percent with the Medical Assistant.

For some of the lower level titles, the bulk of their jobs are duplicated by upper level titles. For example, 44 percent of the Dark Room Aide's tasks are also done by the X-ray Technician; and 76 percent of the Medical Assistant's tasks are also done by LPN's.

While there is no major problem of overlap across many occupational levels or titles, there is the impression that better demarcations could be made among tasks of the Nurse Practitioner, Family Health Worker, LPN's and Medical Assistants.

Figure 41. DISTRIBUTION OF OVERLAP TASKS BY TITLE

Job Title	Number of Tasks (total of 273 unique tasks)												
	Total	Total Overlap	Overlap by Title: Number, and Percent of Total for Row										
			RAD	OB-GYN	INT	PED	NP	X-ray	FHW	LPN	EKG	MA-U	DRA
Radiologist	8	0											
Obstetrician-Gynecologist	21	5 24%			5 24%	4 19%							
Internist	30	18 60%		5 17%		16 53%	1 3%						
Pediatrician	26	16 62%		4 15%	16 62%								
Nurse Practitioner	46	10 22%			1 2%				8 17%	5 11%		5 11%	
Lead X-ray Tech., X-ray Tech.	18	5 28%							1 6%	1 6%		1 6%	4 22%
Family Health Worker	63	17 27%					8 13%	1 2%		6 10%	1 2%	7 11%	1 2%
LPN (Emergency Room and Unit)	83[a]	31 37%							6 7%		1 1%	26 31%	
EKG Technician	12	4 33%							1 8%	1 8%			2 16%
Medical Assistant-Unit	34	27 79%					5 15%	1 3%	7 21%	26 76%			
Dark Room Aide	9	7 78%						4 44%	1 11%		2 22%		

[a] LPN-Emergency: 53; LPN-Unit: 51. There are 21 tasks which overlap across the two LPN titles.

It is important to note that some overlap is inevitable, because certain administrative or related activities are needed for many titles due to the circumstances involved. For example, since the Family Health Worker functions in patients' homes, one would expect overlap with activities performed in the Center.

Detailed Data

Figure 42 presents the details of the task overlap data. The first set of tasks is classed as "assignable." This means that they probably can be assigned to fewer titles than is now current, or even to other titles than is now current. The second set of overlap tasks is classed as "difficult to avoid" due to the circumstances of their performance. It is not expected that these overlaps can be avoided.

The information in Figure 42 includes each task's code number, its abbreviated name, the titles in which it appears, the task factor to which it was assigned, its level, and its Frequency scale value for each title in which the task occurs. (Appendix B.3 presents the Task Frequency scale.) The tasks are arranged in descending order by their assigned HSMS levels.

The first five tasks in Figure 42 are found in professional and semi-professional titles. For most of these tasks it might conserve resources to eliminate overlap and concentrate the tasks in only one title. In the case of Factor Five tasks, which benefit from practice, this might even improve their performance.

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY
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Task Code No.	Abbreviated Name of Task	Titles in which task is found			Frequency[d]
		Title[a]	Factor[b]	Level[c]	
	ASSIGNABLE OVERLAP				
20	Reading and interpreting "stat" X-rays on request.	INT	Three	5	4
		PED			6
115	Deciding on and arranging referral of patient to agency.	NP	Four	4	6
		FHW			9
34	Incising and draining abcess or boil.	INT	Five	4	1
		PED			4
33	Removing sutures.	INT	Five	4	2
		OB-GYN			3
		PED			3
17	Determining if suspect EKG reading is true or artifact.	INT	Five	4	3
		PED			6
18	Drawing blood from non-child patient's vein.	INT	Five	3	1
		NP			2
15	Determining presence of trichomonas on slide.	INT	Six	3	2
		OB-GYN			3
		PED			3
16	Examining a slide for gonococci.	INT	Six	3	2
		PED			2
14	Evaluating a skin specimen slide for fungi.	INT	U	3	2
		PED			4
35	Examining spun-down urine sediment and supernate.	INT	U	3	3
		PED			4
36	Examining blood slide.	INT	U	3	2
		PED			6
93	Applying prepackaged tine test for TB.	NP	Five	2	6
		LPN-U			8
		LPN-E			7
		FHW			3
		MA-U			7

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray; Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

[c] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[d] Numbers refer to scale values of the Task Frequency Scale (B.3).

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
p. 2 of 4

Task Code No.	Abbreviated Name of Task	Titles in which task is found			Frequency[d]
		Title[a]	Factor[b]	Level[c]	
	ASSIGNABLE OVERLAP (continued)				
95	Tablet or dipstick urine test.	NP	Five	2	4
		LPN-U			3
		LPN-E			6
		FHW			4
		MA-U			6
96	Taking throat culture specimen; labeling.	NP	Five	2	4
		LPN-U			4
		LPN-E			7
		FHW			2
		MA-U			6
161	Weighing and measuring patient and recording.	LPN-U	Five	2	8
		LPN-E			6
		MA-U			8
162	Irrigating ear with solution as ordered.	LPN-U	Five	2	3
		LPN-E			6
		MA-U			1
199	Preparing patient and taking vital signs before Dr.'s examination.	LPN-U	Five	2	8
		LPN-E			8
		MA-U			8
201	Giving cold water or alcohol rub on Dr.'s orders.	LPN-U	Five	2	2
		MA-U			4
98	Obtaining clean catch urine specimen.	NP	U	2	4
		LPN-U			7
		LPN-E			7
		MA-U			6
139	Assessing results of tine test.	LPN-U	U	2	8
		LPN-E			7
		FHW			3
		MA-U			7
140	Teaching how to do urine test using tablet.	LPN-U	U	2	3
		MA-U			6
141	Testing stool specimen for blood using tablet.	LPN-U	U	2	1
		MA-U			6
157	Checking chart for entry of lab results.	LPN-U	U	2	8
		MA-U			8
71	Developing radiographs using hand developer.	X-ray	Three	1	3
		DRA			6
116	Deciding whether to provide patient with transportation.	NP	Four	1	3
		FHW			8
153	Assisting Dr. in medical exam with materials.	LPN-U	Five	1	3
		MA-U			7
69	Using automatic developer for X-ray and spot films.	X-ray	U	1	9
		DRA			8

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
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Task Code No.	Abbreviated Name of Task	Titles in which task is found			Frequency[d]
		Title[a]	Factor[b]	Level[c]	
	ASSIGNABLE OVERLAP (continued)				
70	Preparing hand developing tank for X-ray film.	X-ray	U	1	3
		DRA			4
72	Loading X-ray film cassettes.	X-ray	U	1	9
		DRA			9
97	Teaching or collecting specimen for pinworm test.	NP	U	1	2
		FHW			2
135	Readying treatment room by wiping up and cleaning.	LPN-U	U	1	8
		LPN-E			7
		MA-U			8
137	Delivering cultures and specimens to incubator or lab.	LPN-U	U	1	4
		MA-U			7
145	Preparing equipment for autoclave by washing and wrapping.	LPN-U	U	1	4
		MA-U			6
146	Setting autoclave.	LPN-U	U	1	6
		MA-U			6
147	Preparing patient for pelvic exam; preparing slides.	LPN-U	U	1	8
		LPN-E			7
		MA-U			6
149	Sterilizing equipment in hot water sterilizer.	LPN-U	U	1	6
		MA-U			6
151	Preparing treatment room by cleaning up and stocking supplies.	LPN-U	U	1	4
		MA-U			6
155	Obtaining urine specimen; preparing for lab.	LPN-U	U	1	7
		MA-U			8
160	Escorting patient within institution.	LPN-U	U	1	2
		MA-U			6
164	Filling out forms with ID information.	LPN-U	U	1	4
		MA-U			7
	OVERLAP DIFFICULT TO AVOID				
27	Lectures to staff and students on health and medical subjects.	INT	Two	6	2
		OB-GYN			2
37	Treatment of injuries.	INT	Five	6	1
		PED			6
28	Emergency life support care.	INT	Five	6	1
		PED	One	5	2
29	Informally instructing subordinates in patient care.	INT	Two	5	4
		PED			3
32	Suturing lacerations.	INT	Five	5	1
		PED			6
91	Administering first aid in emergency.	NP	Five	5	2
		FHW			2
24	Assessing urgency of follow up for no-show patients.	INT	Two	4	6
		OB-GYN			6
		PED			7

Figure 42. OVERLAP TASKS BY TITLE, FACTOR, LEVEL AND FREQUENCY (continued)
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Task Code No.	Abbreviated Name of Task	Titles in which task is found			Frequency[d]
		Title[a]	Factor[b]	Level[c]	
	OVERLAP DIFFICULT TO AVOID (continued)				
23	Filling in forms and letters describing pt.'s medical condition for institutions.	INT	Four	3a	6
		OB-GYN			6
		PED			7
26	Participating in committees at institution.	INT	Four	3a	2
		PED			6
203	Reinforcing diet and making ethnic substitutes.	LPN-U	Four	3b	3
		FHW			6
218	Bandaging or changing bandage for minor wound as ordered.	FHW	Five	3	3
		MA-U			4
190	Assisting patient to or from wheelchair.	LPN-E	Five	2	6
		FHW			4
200	Applying hot or cold compress on Dr.'s orders.	LPN-U	Five	2	2
		FHW			3
128	Deciding order for non-medicinal supplies.	LPN-U	U	2	4
		LPN-E			4
		EKG			2
113	Giving general reassurance to any patient.	NP	Four	1	8
		LPN-U			8
		LPN-E			9
		FHW			8
		MA-U			8
138	Noticing and reporting relevant patient symptoms to Dr.	LPN-U	Four	1	8
		MA-U			8
204	Providing orientation tour of facilities and procedures at Center.	LPN-U	Four	1	2
		FHW			2
75	Translating Spanish-English conversation.	X-ray	U	1	7
		LPN-U			7
		FHW			7
		MA-U			7
231	Deliver and/or pick up forms and supplies.	FHW	U	1	3
		EKG			6
235	Judging what supplies are needed and requesting.	FHW	U	1	8
		DRA			4
267	Routine cleaning and dusting of machines.	EKG	U	1	6
		DRA			6
269	Deciding whether repair is needed for machine.	EKG	U	1	2
		DRA			3

[a] Radiologist = RAD; Internist = INT; Obstetrician-Gynecologist = OB-GYN; Pediatrician = PED; Lead X-ray Tech. and X-ray Tech. = X-ray: Nurse Practitioner = NP; LPN-Unit = LPN-U; LPN-Emergency = LPN-E; Family Health Worker = FHW; Medical Assistant-Unit = MA-U; EKG Tech. = EKG; Dark Room Aide = DRA.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

[c] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[d] Numbers refer to scale values of the Task Frequency Scale (B.3).

The fact that the Family Health Worker does task 115, which is at Level 4, warrants further inspection. Either the task was overrated in job analysis, or the Family Health Worker is assigned above trained capabilities, or a disproportionate effort had to have been made to train for a task that should probably be reached at a later stage than the performer's title suggests. The fact that the task overlaps with the Nurse Practitioner suggests that the task may need to be redone by the Nurse Practitioner in any event and that there may be wasted time involved.

Tasks 18, 15, 16, 14, 35 and 36 all show overlaps, primarily among physicians' titles. None of the tasks are at a level which warrants their being assigned to physicians. These tasks may waste precious physician time and should either be reassigned to only one, less busy professional or should be given to a trained technician. It is not unusual to find physicians doing such laboratory work because they do not trust the competence of the technician. For a sensitive management, this should signal the need for better training, and not the assignment of such tasks to professionals.

The overlap in tasks 93, 95 and 96 does not seem to be justifiable. One could argue that these specimen takings and tests need to be done at home, in the Unit, and in the Emergency room, but it cannot be argued that they should be done by the Nurse Practitioner. This performer's Frequency scale values for these tasks are sufficiently high to suggest that the tasks be delegated because they waste too much of the Nurse Practitioner's time.

The remainder of the assignable overlap tasks have the general characteristic that they are duplications of tasks largely involved when the higher-level performer covers for a subordinate's absence or redoes the tasks of a subordinate. None of these 26 tasks is at a level above 2. One wonders whether there would be an advantage in staffing patterns including more lower-level personnel to cover absences, thus avoiding the need to waste the training of higher level staff whose time is scarce.

Figure 42 indicates that there are 22 tasks which involve overlap which probably cannot be avoided. They are listed to permit review of whether they are, in fact, assignable.

JOB TITLES, TASK FACTORS AND LEVELS

Task data giving the factor and level assignment of each of a title's tasks provide insights into the appropriateness of staff utilization patterns. The basic data of this type are presented in Appendix Table A.10. Figure 43 summarizes these data.

In Figure 43 the titles are presented on the left in descending order by their maximum annual salaries. The next column on the left shows the total tasks for each title. The next seven columns show the numerical and percentage distribution of tasks to task factors. The seven columns on the right show a similar distribution of tasks to HSMS levels. (An optimal allocation of tasks to levels by title would be represented by a diagonal set of entries by level falling from left to right, no more than two or three columns wide.)

Figure 43. DISTRIBUTION OF TASKS TO FACTOR AND LEVEL BY TITLE

Job Title	Total	Factors							Levels						
		One	Two	Three	Four	Five	Six	Unass.	7	6	5	4	3	2	1
Radiologist	8			6 75%		1 12%	1 12%	1 12%		2 25%	4 50%	1 12%			1 12%
Obstetrician-Gynecologist	21	11 52%	2 10%		1 5%	3 14%	8 38%		4 19%	6 29%	5 24%	3 14%	4 19%		
Internist	30	4 13%	3 10%	1 3%	3 10%	14 47%	3 10%	3 10%		8 27%	6 20%	8 27%	9 30%		
Pediatrician	26	1 4%	6 23%	1 4%	2 8%	12 46%	2 8%	3 12%		8 31%	5 19%	5 19%	9 35%		
Nurse Practitioner	46		4 9%	1 2%	19 41%	14 30%	9 20%	3 6%			7 15%	12 26%	13 28%	8 17%	6 13%
Lead X-ray Tech., X-ray Tech.	18			11 61%	1 6%			6 33%					5 28%	6 33%	7 39%
Family Health Worker	63				28 44%	23 37%	4 6%	11 17%			1 2%	4 6%	14 22%	24 38%	22 35%
LPN (Emergency Room and Unit)	83			1 1%	11 13%	37 45%	1 1%	34 41%				2 2%	11 13%	38 46%	33 40%
EKG Technician	12			4 33%				8 67%						5 42%	7 58%
Medical Assistant-Unit	34			1 3%	6 18%	11 32%	1 3%	16 47%					2 6%	17 50%	16 47%
Dark Room Aide	9			2 22%				7 78%							9 100%

Note: Tasks appearing in more than one factor or level are counted for each factor or level. See Appendix Table A.10 for detailed information.

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Distribution By Factor

The assignment of tasks to factors provides some interesting insights. There is no uniformity with respect to the spread across factors. It may be that some performers are operating in more areas than is appropriate for optimum use of training time or resources.

The Radiologist is concentrated in Factor Three. The task of instilling the opaque fluid for the hysterosalpyngography (5) requires skills and knowledge in Factors Five and/or Six. This is a seeming waste of the additional training beyond that for Factor Three. One expects the Obstetrician-Gynecologist to have tasks in Factors One and Six. The inclusion of tasks on other factors reflects the fact that the Obs-Gyn specialty is pieced together from surgery and physical treatment, and picks up all the other functions while concentrating on the female anatomy, its dysfunctions, and pregnancy. The Internist and Pediatrician have the most pronounced spread across all factors. With the exception of tasks in Factor Six, these are understandable due to the wide-ranging responsibilities assigned to physicians at the Center.

The fact that the Nurse Practitioner and several of the lower level titles also cover more than three factors is somewhat questionable if sequences are to provide upward movement by building on lower level training. These data suggest the possibility that Nurse Practitioner, Family Health Worker, LPN, and Medical Assistant assignments could be made within the titles to sub-specialties. (Such suggestions will be discussed in Chapter 6.) The distribution for the Nurse Practitioner and

Family Health Worker are similar with respect to Factors Four and Five. A surprising number of LPN tasks are not distinct enough for assignment to any factor.

Distribution By Level

The distribution of tasks by level is of more immediate consequence with respect to utilization. The observations to follow in this and subsequent chapters are suggested by the data, and may be wide of the mark. They are raised for the consideration of the Center or for other institutions with similar profiles for their illustrative value.

For most efficient use of resources, the physician titles should not include tasks below Level 4 (semi-professional) and should probably be concentrated in Levels 5 through 7. The Nurse Practitioner could be expected to perform tasks at Level 5 if special training is provided, and should not have tasks below Level 4 if training is not to be wasted.

The X-ray Technician's two years of training would suggest tasks at Level 4, and not below Level 3. The Family Health Worker, who receives a somewhat higher salary than the LPN, is not required to take the nine months of training for LPN licensure. Neither performer should have tasks above Level 3, nor, probably, below Level 2.

The EKG Technician and the Unit Medical Assistant are both trained at the Center and, though there is a difference in their salaries, one would expect tasks at Levels 1 and 2 to be appropriate. The Dark Room Aide can be expected to have tasks at Level 1.

Figure 43 indicates that all of the physicians have tasks below their minimum desirable levels. Such tasks include loading and unloading the fluoroscopy machine for the Radiologist, doing lab work and some delegatable physical treatments for the Internist, and, similarly, doing lab work and delegatable physical treatments for the Pediatrician.[1]

The Nurse Practitioner has 7 tasks at Level 5. There is special training at the Center for five of these. Two teaching tasks, (numbers 120 and 123) cover the formal and informal training of subordinate health workers. There is an indication that specific training for this formal or informal teaching is only partially being provided to the Nurse Practitioners at the Center.

At the other end of the spectrum, the Nurse Practitioner has 13 tasks at Level 3, eight at Level 2 and six at Level 1. Ignoring the administrative tasks at Level 3a in Factor Four, there are 26 out of 46 tasks which do not tap the full potential of the training given the Nurse Practitioner. Inspection of Table A.10 will indicate that these tasks largely overlap with those of lower-level employees or are accounted for by the fact that there are clinical procedures beyond the reach of the Family Health Worker. It would seem probable that someone able to operate at the RN or LPN level in clinical tasks could relieve the Nurse Practitioner for higher-level assignments. Moreover, it is possible that, with proper training in how to teach subordinates, the Nurse Practitioner might be able to see to it that tasks which overlap with those of subordinates could safely be delegated to those subordinates.

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[1] Table A.10 in Appendix A presents the tasks for each title in descending order by level, and it will be obvious by inspection what is involved in the tasks as they are referred to in the text. Table A.1 provides more detailed information on the content of the tasks.

Even with the inclusion of the Lead X-ray Technician's tasks, none of the X-ray Technician tasks appear at Level 4. This was the first evidence for an insight that later received additional support. The X-ray tasks performed at the Center are at Level 3 and do not warrant the two years of training now required for licensure by the New York State Department of Health. (Three states currently require licensure for X-ray Technicians.) Most of the X-ray Technician tasks that are at Level 2, and all of those at Level 1 are also done by the Dark Room Aide or could be assigned to someone at a lower level.

The X-ray tasks at Levels 1 and 2 include some which are done if the Dark Room Aide is absent. Again, the question arises about the advantage of having sufficient numbers of lower level staff to cover for absences at their level so that higher-level staff need not waste their training.

The LPN has two tasks which may be too high for the title if they are to be done properly. These are tasks 171 and 202. The first involves assessment of the urgency of an emergency patient's need to see a doctor (Emergency Room); the other involves giving introductory information on birth control devices. Neither of these two tasks is fully accounted for in the LPN program that was questioned, and it may therefore be possible that the task adheres in the individual performer's abilities rather than title, or that the tasks are not being performed at an adequate level. This warrants examination by the Center.

On the other hand, there are 33 tasks at Level 1 which the LPN performs and which could properly be done by a Medical Assistant or someone else at the entry Aide level. Forty percent of the LPN tasks do not tap the potential of LPN training. A good deal of overlap and the covering of subordinates' duties is again involved. Similar comments to those already made apply here.

While the LPN receives more credentialled training than the Family Health Worker, their salaries put them on par with each other. They share a common profile with respect to the degree of underutilization. (It is a little worse for the LPN.) About 35 percent of the Family Health Worker's tasks (22 tasks) could be done by a Medical Assistant or someone else at the Aide level.

By way of contrast, however, the Family Health Worker has five tasks which may be beyond the reach of this title's experience and training. These tasks include emergency first aid (91), decision on and referral of the patient to a proper agency (115, already discussed), the two routine examinations (prenatal, 248, and neonate, 250), and teaching the patient basic information on sex, contraception and abortion referral (226).

Task 115 might better be done by the Nurse Practitioner, with whom it overlaps. The level of the first aid which the Family Health Worker provides may be such that a different task is involved from that of the Nurse Practitioner with which it is now shown to overlap. The two examination tasks and the education task may be subject to redoing by the Nurse Practitioner, or may have been overly inflated in task identification. However, if these tasks are, in fact, being taught to be done as stated, then the required effort would be out of line when compared with the other tasks being taught, or one would be led to expect that their performance would be less than satisfactory. It is suggested that these three tasks be reassessed in these terms.

The EKG Technician's assigned tasks are at proper levels. However, there are only 12 tasks involved. The task factor data suggest the possibility that job enrichment would be warranted here. The EKG Technician could profitably be involved with additional clinical work, especially eye tests and preparation for X-ray tasks.

The Unit Medical Assistant is lower on the wage scale than the EKG Medical Assistant. The tasks for this title number 34, as compared with 12, and include two at Level 3. The care of minor wounds (218) and the reinforcement in use of contraceptive devices (258) tasks could actually be less demanding than was determined in task analysis. It was coded to require knowledge about care of wounds and healing. It may be that the task is not being performed at such a level or that undue training is being focused on tasks 218 and 258 compared with the other 32 tasks of the title. The Center might do well to inspect these possibilities.

The tasks of the Dark Room Aide are all at Level 1. This is appropriate. Yet, one wonders about the fact that only a few hundred dollars per year separate this title from those of Medical Assistant or EKG Technician. In the case of the Dark Room Aide there is the feeling that the job should be reserved for limited capabilities or be enriched to provide diversity and a chance to move up. Only two of the nine tasks even appear on a task factor, and few can reach to higher level work.

JOB TITLES AND CURRICULA

The curriculum data collected from the educators with respect to the tasks of the pilot test provide some insights with respect to training gaps and patterns.

Physicians

Specific training for the Radiologists' tasks does not appear in the medical school program. This training is apparently obtained later as a specialty. This may be the reason why the Radiologist is a physician first and a specialist second, but it may not be the most sensible way to handle the specialty, which is in short supply.

For the other three physicians' titles there is the impression that diagnostics, lab work, and some treatments are covered at medical school, with the pediatric patient covered along with the older patient.

On the other hand, many treatments such as wart removal, emergency care, bone marrow puncture, and the evaluation of radiographs and EKG's -- all clearly clinical in nature -- are not fully covered by medical school. This may reflect the fact that medical schools, even though they are changing, still start with the theoretical and move later, in internship and residency, to the clinical. It may also be that diagnostic tasks were too glibly given A ratings in the questionnaire and are also not fully covered.

Most of the Nurse Practitioner's tasks are considered to have been covered in prior RN training; many are also covered by the medical school. The tasks that distinguish the Nurse Practitioner from the Nurse are tasks 84 (the pelvic), 86 (the pre-natal exam), 88 (identifying abnormal conditions in the pediatric patient), 100 (administering the Denver Developmental Screening Test), and 120 (planning and writing lectures, and evaluating subordinates). The Center trains completely for all but task 120, for which it does partial training. The Center trains the Nurse Practitioner in other tasks as well, but they are also found in Diploma School or BA nursing programs.

Four of the LPN tasks were not accounted for by the LPN program, although they are apparently covered in the training for other titles. These include applying and assessing the results of the TB tine test, (tasks 139 and 94), inoculating against smallpox, (task 152), and providing introductory information on contraceptive techniques (task 202). Such discrepancies may indicate that, even with licensure restrictions, the clinical content of curricula can vary and still not cover all needs.

A very interesting pattern emerged with respect to the Family Health Worker and the Unit and EKG Medical Assistants. It may be that the person responding for the training department understated the coverage, or that task identification as reflected in the task names used in the questionnaire overstated the task content, but not all the tasks identified for the titles are rated with an A (all or most is covered by program) by the respondent for the Center's training program.

In particular, the Family Health Worker's routine pre-natal (248) and post-partum (249) examinations are not accounted for. For the others, the tasks rated B (a significant amount is covered) may have resulted from the task names being merged with similar tasks and therefore being somewhat inflated in the questionnaire. Other tasks, such as those done in the home, the cooking, bathing, feeding, etc., may be assumed to already be in the grasp of the performer. With respect to the two tasks mentioned above, it may be that these tasks are taught informally. Task 248 is at Level 4, as mentioned earlier; further inquiry here seems warranted.

It was found that all of the X-ray Technician tasks in the questionnaire were fully covered by the program questioned, as well as those of the Dark Room Aide. It is a mystery at present where the Dark Room Aide at the Center learns his tasks, since there is no formal training for him. Given the fact that all the tasks are at Level 1, there is the likelihood that simple orientation on the job is sufficient.

GROSS EVIDENCE OF CURRICULUM OVERLAP

The data collected with the use of the instruments described in Chapter 2 and Appendixes B.1 and B.2 indicate to what extent the educators in the accredited institution or program implicitly acknowledge the possibility of overlap with lower-level programs or the training at the Center. Any rating of 3 or higher on the Curriculum Significance Rating Instrument would warrant following up with a further examination to determine whether the curriculum being taught at one level dealing with task content is different or the same as that taught at the other. The results reported below are not proof that one-to-one overlap exists, since it is possible that one program teaches task content as a series of procedures while another teaches the content in a more transferable, theoretical,or conceptual way. The results do indicate the areas that can fruitfully be explored for the possible creation of curriculum ladders using advanced standing from one to the other to shorten training time.

Figure 44 is divided into two parts. The first left-hand column of Part I shows the titles whose tasks were culled from the questionnaire (B.1) and accounted for by the programs. The "No. of Tasks" column on the left refers to the number of tasks of the title that were in the questionnaire. The program is listed next,and then the extent of coverage by the program (A and B, or A, B and C). The "No. of Tasks" column on the right indicates the number of tasks which the program acknowledged that it covered with respect to the job title involved. (The questionnaire did not indicate the titles, however.) The final column on the

Figure 44. PRELIMINARY EVIDENCE OF CURRICULUM OVERLAP FOR PILOT STUDY TASKS

I. JOB TITLE OF TASKS THAT ARE COVERED BY CREDENTIALED PROGRAMS

Job Title	No. of Tasks	Program Judging Significance	Tasks Already Rated As:[a]	No. of Tasks	Scale Value[b]
Medical Assistant and EKG	28	LPN	A, B or C	18	5
Medical Assistant and EKG	28	Diploma RN	A, B or C	26	3
Medical Assistant and EKG	28	AA-RN	A, B or C	20	1
Family Health Worker	44	LPN	A, B or C	37	5
Family Health Worker	44	Diploma RN	A, B or C	43	3
Family Health Worker	44	AA-RN	A, B or C	33	1
LPN: Unit and Emergency	42	Diploma RN	A, B or C	42	3
LPN: Unit and Emergency	42	AA-RN	A, B or C	38	5
LPN: Unit and Emergency	42	BA-RN	A, B or C	38	3
Nurse Practitioner (All)	35	Medical School	A, B or C	33	3
Nurse Practitioner (Those taught at Center)	8	Medical School	A or B	7	3
X-ray Technician and Lead X-ray Technician	11	Radiological Technician	A, B or C	11	3

II. TASKS TAUGHT IN MORE THAN ONE PROGRAM

Program Indicating Tasks Completely Taught	Program Judging Significance	Tasks Already Rated As:[a]	No. of Tasks	Scale Value[b]
Diploma RN (A tasks)	BA-RN	A or B	70	3
Diploma RN (A tasks)	Medical School	A or B	43	3
AA-RN (A tasks)	BA-RN	A or B	39	3
AA-RN (A tasks)	Medical School	A or B	16	3
BA-RN (A tasks)	Medical School	A or B	49	3

[a] Program person checked A, B or C. Letters refer to the following:

A..Curiculum covers all or most of the specific procedures of the task or all or most of the subject matter applied in the performance of the task.

B..Curriculum covers a significant amount of the procedures of the task or a significant amount of the subject matter applied in the performance of the task.

C..Curriculum covers a small amount of the procedures of the task or a small amount of the subject matter applied in the performance of the task.

[b] Program person indicated that curriculum content of tasks amount to:

5..Several courses or more in the program.

4..An entire course or major portions of several courses in the program.

3..A major portion of a course or minor portions of several courses in the program.

2..A minor portion of a course in the program.

1..A negligable portion of a course or several courses in the program.

right is the program representative's judgment about the degree to which the curriculum content represented by the tasks partakes of the program's total curriculum.

As can be seen, the LPN program claims that those of the tasks of the Family Health Worker and the Medical Assistant which are covered in its curricula amount to several courses or more in its program. This is of particular interest when it is remembered that the Family Health Worker job was not designed to replace the LPN, and that the Medical Assistant is subordinate to the LPN.

The evidence indicates the possibility for planning to have the LPN program agree to take employees of the Center with advanced standing. This is very important when it is remembered that the salary level for the Family Health Worker is above that of the LPN. Without licensure, the Family Health Worker currently has no place to go outside the Center at competitive salary levels. For the Medical Assistant there is the promise of a natural career ladder!

The next significant finding in Part I of Figure 44 is that the tasks of the LPN, as performed at the Center, and to the extent that they are covered by the Associate Degree Nursing program, amount to several courses or more in the program. Since the LPN comes from a credentialed program, here is evidence of something said by many: that the LPN training warrants advanced standing in RN programs. When one considers that the LPN tasks at the Center reflect only a portion of the LPN program content, the evidence seems very strong.

It should be noted that the Medical Assistant's and the Family Health Worker's task contents also are rated as a major portion of a course or minor portions of several courses in the Diploma RN program. The LPN program is similarly rated by the RN Diploma program and the RN Baccalaureate program.

The Nurse Practitioner's tasks were presented in total and also just those tasks that are are accounted for by training at the Center. In either case, the medical school acknowledges that it covers most of these, and that they amount to a major portion of a course or minor portions of several courses in medical school. This is partly what leads us to suggest that nursing tasks such as the junior level diagnostics being done by the Nurse Practitioner are too diffuse and cross too wide a factor range to amount to an entire course or courses in medical school.

Another significant finding in Part I is that, although all the X-ray Technician's tasks are fully covered by the program related to it, the content they represent amounts to only a major portion of a course or minor portions or several courses in the program.

There is therefore little justification, at least at the Center, for the two years of associate degree level study now required for licensure for the title. It is clear that an earlier exit point is required which would permit the graduate to operate in X-ray tasks such as those at the Center with much less expenditure of time, money and educational resources.

Part II of Figure 44 was derived by taking all of the tasks listed as totally covered by a program (A) regardless of the title in which it appears at the Center,and asking a given program representative about those it covers completely (A), or to a significant extent (B). The framework is still that of the Center's tasks, but this approach permits inspection of program-to-program overlap. The possibility of various nursing program overlaps and overlap with medical school was the focus. The results indicate that each program regards its coverage of the lower level program's content to amount to a major portion of a course or minor portions of several courses. Even though 70 tasks are covered in common by the Diploma RN and BA-RN programs, the latter acknowledges no more overlap for the Diploma program than for the 39 tasks whose contents it shares with the BA-RN program. It gives both a rating of 3. Since it must be noted that these instruments were not identified by program name, the results cannot be attributed to bias.

RECOMMENDATIONS ON JOB AND CURRICULUM LADDERS

The recommendations listed here are fewer than those alluded to in the foregoing pages of this chapter. That is because the actual conditions in task assignments and curriculum contents are subject to review and refinement from the point of view of acceptable performance. Earlier suggestions will be reviewed by the institutions if they are judged insightful. The recommendations listed below are more obvious and clear-cut. They deal with the broad questions of the task content of job titles, and job and curriculum sequences. The suggestions assume the relative wage relationships now in existence and the current structure of existing curricula.

1. The entry level at the Center with respect to the tasks covered should provide for greater diversification and **should** include Level 1 tasks now covered by the Dark Room Aide, Medical Assistant and some work of the EKG Technician, at the Dark Room Aide wage level.

2. The level of Medical Assistant should be made up of three sub-specialties. One should cover eye tests, EKG and tasks in the X-ray department (other than the X-ray tasks themselves). This should lead to release-time training in an X-ray Technician program. Meanwhile, efforts should be made to provide a one-year licensure structure for X-ray tasks such as those at the Center, with a year's credit for graduates usable in the current 2-year programs.

   The second and third specialties should derive from the Medical Assistant's current clinical tasks at the Center, but should lead to release-time training in one of two areas. One would be for upgrading to Family Health Worker. The latter functions would benefit from the Medical Assistant's clinical experience at the Center where direct supervision is provided as well. The second upgrading avenue would take the Medical Assistant into an LPN program with advanced standing. Placement in LPN assignments would be accomplished on completion of the course work.

   This proposal eliminates redundant training in Medical Assistant and Family Health Worker titles and in Medical Assistant and LPN titles.

3. The jobs of the LPN and the Family Health Worker should be made more interchangeable with respect to training and licensure or should be divided into an LPN Family Health Worker and a Social Service Family Health Worker with specialties in clinical for the one and in health education, counseling, and social service for the other.

4. It should be possible for the LPN and the Family Health Worker (clinical) to receive advanced standing in a nursing program and to then go on to whatever the Nurse Practitioner title eventually covers. It should also be possible for the Family Health Worker (social service) to receive advanced standing in comparable schools of social

work, clinical psychology, etc. These suggestions should be examined jointly with existing programs.

5. It should be possible for current Nurse Practitioner training to be planned in collaboration with medical schools so as to provide advanced standing for clinical specialties in female care or physical treatments yet to be assigned.

6. Elimination of overlap tasks and tasks at levels below current capabilities should be accomplished by a careful review of funtion. Tasks should be delegated downward and assured adequate performance at lower levels by providing the lower levels with adequately training and sufficient staffing. Creation of a multi-purpose entry level title should make this possible.

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CHAPTER 6

JOB LADDER RECOMMENDATIONS

This chapter draws on the pilot test results, the goals of the Dr. Martin Luther King, Jr. Center, and the philosophical approach which underlies the creation of job and curriculum ladders, to present a set of idealized job ladders. The word "idealized" is not meant to suggest "unreal" or "impractical." Rather, the term is meant to convey, "that which would appear to be clearly rational, logical and socially beneficial if major institutional obstacles to implementation can be overcome."

The ladder suggestions will require major reorganization of jobs and educational programs if they are to be implemented. Some will require changes in current licensure practices. They are presented as a set of alternatives in the hope that the force of their general logic will provide an impetus for change. None of the specific details is as essential as the general approach which the ladders represent.

However, the ladders should prove to be generic. That is, the jobs described should be applicable in any ambulatory care setting, and especially in any health maintenance organization serving a community.

THE LADDERS AND CENTER GOALS AND OBJECTIVES

The philosophy and goals of the Dr. Martin Luther King, Jr. Health Center focus on the relationship between a family existing as a physical and social entity, and its health and social service needs. The Center interprets this to mean that the family requires continuity of attention,unity of service,and an emphasis on its own view of its problems. Stated another way, one might say that the Center is not made to serve the structure of the health and hospital industry, which is geared to curing specific pathologies (illness). It is more designed to deal with the concerns of the family, which stem from its developmental problems at the various stages of birth, childhood, adolescense, sex, marriage, parenthood, maturity, old age, and, eventually, dying.

This focus on serving a family's changing needs is relevant and in keeping with the concept that a Community Health Center must serve its community. However, implementation of such an approach requires revision of traditional services and health jobs,and the training of staff in a consistent way. This would set the family's developmental needs in the center of the stage, rather than the individual illnesses which are abnormalities related to the more enduring and continuous life processes. As a result,the health maintenance practitioner would be at the center of the stage, and the specialist would be set off as a critically important but supplemental performer.

Analysis of the HSMS pilot study tasks and the resulting task sequences provided an unexpected insight. It was that, though the goals of the Center are clear, the structure of its jobs does not seem to fully mirror the goals. Though the role of the Team is apparent, its most essential aspects seem to be somehow truncated and out of focus.

We mean by this that the central function of attending to the developmental needs of the family and, particularily, emphasis on health maintenance, preventive medicine, and counseling on socially related problems is not fully at the heart of the operations, especially within the Team. The task factor containing the core of such functions was Factor Four. The reader will recall from Chapters 3 and 4 that, though Factor Four contained 60 tasks, many were teaching, monitoring, conference and committee tasks. There were no functions or tasks at Levels 5, 6 or 7; the Nurse Practitioner tasks did not show a truly independent role aside from the managerial one.

The job ladders to be described in this chapter show varying degrees of innovation. However, the one which reflects the greatest restructuring is the Factor Four ladder. It has been given the central role, and is an attempt to develop the potential functions already found in Factor Four for the Center.

It will be seen that the suggested job ladders are based on the pilot test task factor structures. Unlike the task sequences described in Chapters 3 and 4, however, they have been selectively culled and adapted to create more coherent job structures.

The jobs presented in this chapter draw primarily on tasks already found in the pilot test. Some of these tasks are modified to serve what seems to be more comprehensive needs. However, there are also entire job levels and several tasks and functions that were not found in the pilot test. These have been added to fill needs that would seem to carry out the underlying goals and philosophy of the Center and of the Family Health Team , and also serve the secondary objective of conserving the scarce resources of the physician.

The job ladders are presented as idealized suggestions. Therefore, disagreements about the particular level or location of a given task,or the omission of a particular item,is not as relevant as the major thrust of the design. Modifications of these designs are infinitely possible.

OMISSIONS OF TASKS FROM PROPOSED LADDERS

A good deal of task overlap present in the actual jobs studied in the pilot test has been eliminated by creation of a rotating corps at the Aide level. This serves the purpose of providing a constant source of experienced manpower to cover absences in one functional area or another. By virtue of this experience in all major areas, the employees at the Aide level will be able to make choices about the specialty area in which they wish to rise. Management will be in a position to take account of especially gifted employees and encourage them. Finally, the rotation will permit job enrichment for functions that are now being carried out with deadly monotony, such as in the Dark Room.

Many of the administrative tasks of the pilot test involving supervision, monitoring, inventory and supply functions, and handling of discipline and work schedules have been omitted. Such tasks are better developed by the institution to suit its needs. The fact that such tasks also require skills, knowledge and training should not, however, be forgotten; the HSMS task data already presented include such information.

Since many jobs in the Center were not studied, their tasks are not accounted for. In addition, the Level 3 laboratory tasks are not included in the ladders since they obviously should be part of a different set of ladders.

A good many of the tasks involving the formal or informal teaching of subordinates have been eliminated except in the ladder connected with Factor Four. This is because the degree of clinical teaching and formal instruction will be affected by the relationships between upgrading training in credentialed programs and clinical or formal training at the Center. The personnel carrying out teaching duties may vary depending on arrangements. It should be remembered, however, that teaching requires its own set of skills and knowledge, and that the elements of planning,and assessing a student's level of performance, educational needs, and progress are essential for successful teaching when acceptable work performance is the goal. These task elements are missing in many of the Center's current teaching tasks, and this situation may warrant remedy in the future.

A number of the medical examination tasks now found in the Nurse Practitioner's and the Family Health Worker's current jobs have been modified or eliminated. The reasoning is that, aside from the screening which can be provided by extremely well trained staff, the multiple-staged examinations are redundant. The Family Health Worker spots a problem and tells the Nurse Practitioner about it; who then reexamines and tells the physician about it; who then redoes the whole examination. This seems to be wasteful of manpower resources and does not really save physician time. Such combinations of tasks probably do not promote Team spirit either, since, when there is a weak link in a chain, the tendency is to by-pass it and close the circle without it. The ladders proposed here are designed to provide differentiated services at each level, most of which are uniquely provided at that level. There is some examination and screening at levels below Level 6, but it is kept to a minimum below Level 4, and is laterally expanded in scope and function at Level 4 so that new functions can be accomplished at that level.

The current tasks of the physician titles at the Center are not represented in the ladders per se. However, in the Figure 45 graphic summary of the ladder relationships (to be presented later in this chapter) the titles appear with their diagnostic and prescription functions. The intent of the ladders is to conserve physician manpower by reassigning delegatable tasks, providing specialists for many of the treatment tasks, and by concentrating the physician's role on the area of true professionalism. Therefore, it is assumed that for each of the physicians the following generic tasks are present:

1. Surgery and post-professional treatment and therapy specialties (where applicable).
2. Diagnostic and prescription of treatment according to specialty.

3. Reassessment of whether to proceed with prescribed course of treatment.
4. Assessment of urgency for follow-up on no-show patients.
5. Review and judgment of letters to institutions describing patient's condition, that are drafted by subordinates.

The Center staff have a number of tasks which involve participation in Team and/or Unit conferences and participation on committees. These tasks really reflect the knowledge and experience of the performer's other tasks. They have not been shown in the ladders. It should be noted, however, that responsibility for calling conferences on behalf of patient needs now rests in the job ladder connected with Factor Four, and is at Level 5. Team conferences are not necessarily the best way to develop team spirit. Since it was not evident from the pilot test that the onference results were a major basis for later task actions, these conferences are now placed under the jurisdiction of the job ladder responsible for coordination and general health maintenance for use only when problem solving requires them.

BENEFITS OF LADDERS

Although recent popular interest in career mobility reflects the social pressures among large numbers of the poor who demand the right to rise to meaningful and economically acceptable levels of achievement, the job ladders presented here serve equally significant purposes which make their implementation essential.

The most obvious function of job ladders, as alluded to at the outset, is to relieve shortages in upper level staff,and shortages in educational resources. The proposals presented in this chapter accomplish this objective. The task analysis has also made it possible to conceive of several other equally valid reasons to prefer the upgrading of many employees to the exclusive employment of new people at each level.

It is now apparent how important some of the HSMS skills are to some of the task functions, particularly in the area of physical treatment and care, where Consequences of Error for Humans and Object Manipulation are very much involved. This suggests that the gradual rise in level of skill, responsibility,and knowledge which is reinforced and tested in actual work practice may result in better, more successful performance at the upper levels than is now the case with students arriving with purely educational experiences and without the mutually reinforcing benefits of education and practice learned in work. The fact that clinical training is part of approved programs in health care suggests the truth of this. However, the experience of the job itself, in connection with release-time training for the next higher level,may be a beneficial source of clinical practice. Especially in the area of physical treatments such as the use of introductory procedures,the long period without practice, inevitable when the student embarks on the long route from high school graduation to internship,seems less than appropriate.

In addition to the benefits from practice in actual physical performances, job ladders provide benefits to the patient in the form of consistent approach and comprehensive awareness. The patient is frustrated by bureaucratic divisions and fragmented services. Much of this comes from the extent to which professionals and sub-professionals work at cross purposes, with different goals, and from the extent to which the elements essential to the service are lost in the cracks between job titles.

The benefits of career ladders must be seen to include the fact that employees share and continually maintain an orientation to the goals of the institution as they rise. There is no danger that, at the top, they will consider themselves separate or independent of the institutions' goals or unrelated to them. Having known the details of functioning at one level, the performer is better able to relate to those details at the next level. This includes knowing what goes wrong at that level -- in a way outsiders can never know -- and compensating for this.

With respect to the Family Health Team, the marked mobility and, therefore, transience of professionals can be compensated for by the continuity of individuals who will rise in relation to services and will maintain links with the family. The goal of continuity of attention is thereby promoted as a bi-product of career ladders.

Another benefit of the ladders is that, unlike the creation of junior diagnostic tasks which are too difuse and shallow in their curriculum content to warrant advanced standing in professional schools

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such as medical schools, the specialties in the ladders can provide enough educational depth in a concentrated area to warrant crediting the educational investment for advanced standing. As the ladders are now proposed there would be a major block of curricula at Levels 4 or 5 which would be designed to provide advanced standing in medical school or another relevant professional school.

Finally, the nature of the ladders is such that current female employees can rise to levels in some specialties not yet open to them, while, in the future, there will be litte need or value in attaching sex images to the ladders at all.

CURRICULUM LADDERS

The ultimate explanation for redundant educational curricula in the field of health manpower education is the fact that each level is designed to be self contained and terminal. In addition, as pressures arose to differentiate the fragmented titles, there was the need to stress that there are differences rather than overlap in curricula.

What is being proposed in this chapter is the joint planning (or at least conferring) of educators in programs above and below a given occupational program's level. They would ascertain the appropriate time to introduce certain subject matter, and at what level, in order to have the most benefit from former training, to fill current needs, and to allow for future needs.

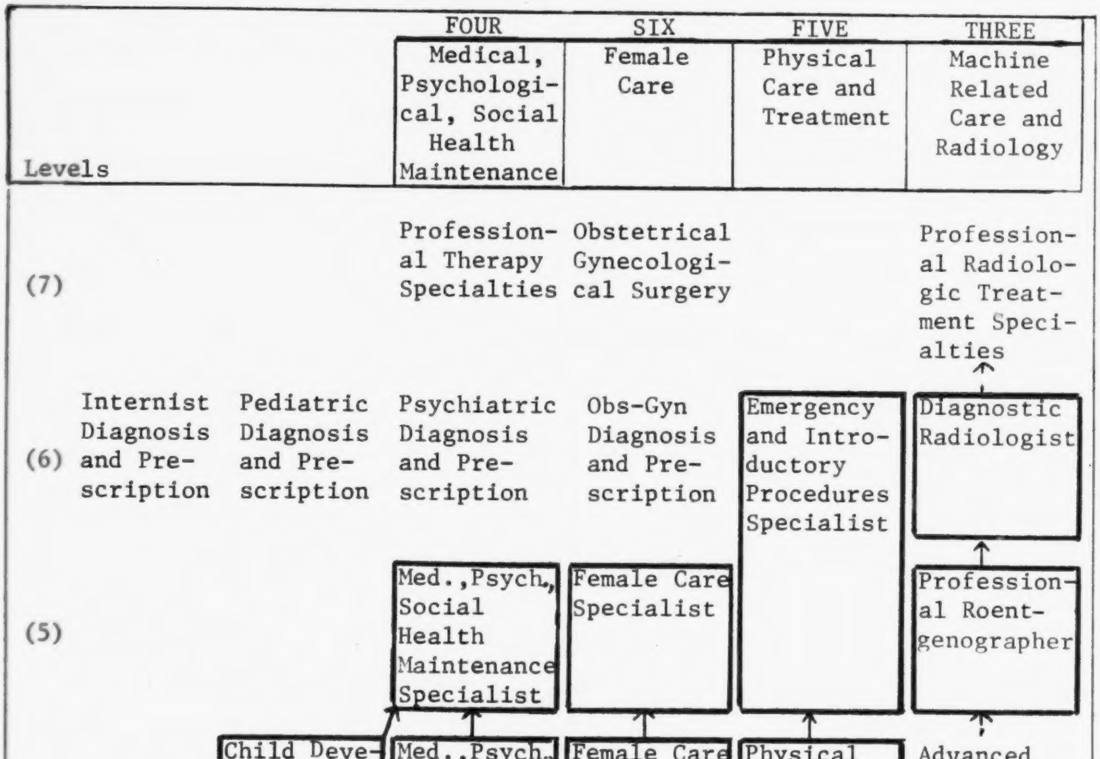
Chapter 4 presented the prototype designs for the use of HSMS task data to identify the skill and knowledge curriculum contents for Factors at given levels,and for planning the movement from one sequence to another. The precise content of those designs in the Figures presented reflect the specific tasks of the sequences involved. They reflect task data which were not thoroughly reviewed. The reader should note that the idealized ladders presented in this chapter call for new functions, expanded tasks and omit many tasks. For these reasons the curriculum data in Chapter 4 are illustrative with respect to this chapter. They are sufficient to show what can be done regarding curriculum sequences. (Chapter 7 discusses the process of curriculum design.) In this chapter the Figures which present the idealized ladders each contain a column suggesting the types of educational links which would be desirable and some comments on the emphasis in curriculum content.

THE IDEALIZED LADDERS

Figure 45 presents graphically the essentials of the four basic ladders being proposed. Each box presents the name of a job function. Factors One and Two of Chapters 3 and 4 are represented only by the physician's functions in appropriate relationships to the other ladders. This acknowledges that there is still a major educational gap between Levels 5 and 6 in the factors and the essential diagnostic, prescription and post-professional surgery or treatment provided by the physician.

Factors (ladders) Three, Five and Six remain relatively the same, except that they are now more compatible with respect to job struc-

Figure 45. GRAPHIC SUMMARY OF IDEALIZED JOB LADDERS FOR CENTER



Levels			FOUR Medical, Psychological, Social Health Maintenance	SIX Female Care	FIVE Physical Care and Treatment	THREE Machine Related Care and Radiology
(7)			Professional Therapy Specialties	Obstetrical Gynecological Surgery		Professional Radiologic Treatment Specialties
(6)	Internist Diagnosis and Prescription	Pediatric Diagnosis and Prescription	Psychiatric Diagnosis and Prescription	Obs-Gyn Diagnosis and Prescription	Emergency and Introductory Procedures Specialist	Diagnostic Radiologist
(5)			Med., Psych., Social Health Maintenance Specialist	Female Care Specialist		Professional Roentgenographer
(4)		Child Development Practitioner	Med., Psych., Social Guidance Practitioner	Female Care Practitioner	Physical Treatment Practitioner	Advanced Radiologic Technologist
(3)			Social Service Family Health Worker	Female Care Technician	Clinical Care Nurse and Family Health Worker	Jr. X-ray Technician
(2)			Assistant Family Health Worker		Medical Assistant	Machine-Related Technician
(1)			Health Worker Aide (Family)		(Clinical)	(Machine)

tures than were the more polyglot compositions of the original task sequences. Factor Four has been transformed from a social service and counseling factor to a medical, psychological and social health maintenance ladder with a child development lateral option related to pediatrics at Level 4.

Levels 1 and 2 contain tasks that were formerly unassigned to factors. The job at Level 1 involves a set of three tours of duty, each containing different tasks, with training and experience in each tour of duty required for each performer. This provides a pool to cover absences at this level.

Lattice options are specifically acknowledged from Level 1 to 2 and between ladders Four and Five at Level 2. They occur between Four and Six and Five and Six from Level 2 to Level 3, from Level 3 to Level 4 within ladder Four, and within Level 4 of ladder Four.

The job ladders and lattice relationships are presented in Figures 46 to 49. For each level (job) the appropriate Figure presents a functional name and a description of the functions and/or abbreviated names of the tasks. Next, there is a column containing the code numbers of the pilot test tasks that are to be covered by the job, or covered but somewhat modified. (Where one or more tasks have appeared to be very similar, the several numbers may appear, but the description will refer to the function only once.) The last column on the left contains references to curriculum content and/or linkages. The lattice relationships are generally referred to by way of footnotes in the Figures. At Level 1, only the tasks of the tour of duty servicing the particular ladder are covered. Thus, the tasks covered by the Health Worker Aide are the summation of those mentioned in Figures 46, 47 and 48.

A Ladder in Medical, Psychological and Social Health Maintenance

The Factor Four Ladder (Figure 46) emphasizes the goals of the Center. The tasks in this ladder treat the family as a developmental entity, and the jobs service that entity by providing it with a source of information, counseling, therapy, education and coordination of services. At the highest level for the factor, Level 5, the performer is in a position to be sure that medical, psychological and social problems are seen as a whole, with the patient or family seen as a whole. The performer has special non-medical service functions and a professional responsibility for seeing to it that related medical services are appropriately interrelated. Patient advocacy at this level is meant to cover arguing and testimony to help get for the community of the patient the social services or legislation needed. This might cover issues such as rat control, provision of a day care center, the development of an outpatient program for the retarded, or a drug addiction program. It would be the responsibility of the performer to assemble and present the information needed to argue for the programs being advocated based on professional evaluation and judgment, and to work with the community to bring the arrived-at point of view to the appropriate level of government.

At Level 4 the counseling function has been deepened and broadened to cover more of the family's developmental needs. There would be

Figure 46. IDEALIZED JOB LADDER FOR CENTER BASED ON FACTOR FOUR (Medical, Psychological and Social Health Maintenance)
p. 1 of 4

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 5: Medical-Psychological-Social Health Maintenance Specialist - Professional level psychotherapy. - Social service guidance and counseling. - Special services for retardation, chronic care, geriatrics, addiction, rehabilitation, etc. - Professional level patient advocacy vis a vis public agencies and social policy. - Leading, initiating, conferences to develop policy re patients' needs (general and specific by case). - Train subordinates informally; train trainees at all levels in how to train subordinates.	None from pilot test; modification of 25	Linked with professional therapy specialities above and nursing specialty training below.
Level 4: Medical-Psychological-Social Guidance Practitioner - Pragmatic counseling on personal problems. - Counseling on sex, contraception, birth, abortion, venereal disease. - Counseling on social problems, problems of adolescence, parenthood, age, dying. - Post hospital care and/or multi agency coordination, follow-up. - Health education for patients in chronic or special care procedures for daily living. - Coordination of the delivery of all services and of Team's servicing of family. - Deciding, advising and arranging referrals to agencies and services. - Information function for questions on care, where to go, etc., discussion on problems. - Semi-professional patient advocacy. - Train subordinates informally.	90, 114, 101, 102, 115, 110, 26	Nursing specialty in behavioral sciences, plus development, epidemiology, preventive medicine. Linked with Level 5, above, and social service training below.
or		
Level 4: Child Development Practitioner - Coordination and planning of health maintenance programs for children, including immunization. - Examine and evaluate medical and psychological development; conferring with MD on abnormalities. - Counseling parents on problems of child rearing and specific childhood conditions.	88	Nursing specialty in child development combining medical and psychological aspects.

Figure 46. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FOUR
(Medical, Psychological and Social Health Maintenance) (continued)
p. 2 of 4

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 3[a]: Social Service Family Health Worker - Identification and discussion of family problems re. developmental stages. - Detailed, specific coordination of services; review and follow-up of provision of services. Schedule planning. - Filling in forms and letters summarizing patient's medical condition for approval of professionals. - Inspection of home for safety, violation of housing and health codes, maintenance of services, lead poisoning, etc. - Accompany patients to agencies. - Follow-up on and coordination of services, agencies, lab tests, results, appointments, continuity in social service programs. - Reinforce care, examine and review symptoms for chronic care patient, pre-natal, post-partum, neonate. - Reinforce diet, daily living care practices, birth control, medication, rehabilitation, procedures and care. - Answer questions on care or refer. - Make ethnic substitutes in diet, daily care procedures. - Discuss availability of social services including consumer protection. - Help with consumer economics and money management. - Arrange referrals and appointments for proper Team member including Medical Family Health Worker, professionals, and Assistant Family Health Worker services. - Taking intake information from new family, reviewing needs and problems, presenting scope of services available and role of entire Center complex. - Providing basic information on developmental problems, sex, contraception, abortion, veneral disease, sanitation, epidemiology, problems of aging, addiction. - Giving developmental screening tests.	236, 127, 111, 219, 122, 252, 148, 249, modified 23, 203, 237, 245-246, 226, 100, 207	Technician level training in medical and psychological aspects of growth and development with basic nursing and social service. Linked with specialty above and Center curriculum below.

[a] Diagonal exit to Child Development Practitioner.

Figure 46. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FOUR
(Medical, Psychological and Social Health Maintenance)
p. 3 of 4

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 2[a]: Assistant Family Health Worker - On orders, follow-up on no shows, check-up or assist in making appointments; decide on whether to provide transportation. - Providing homemaking services including food preparation according to diet needs, on orders. - Reinforcing instructions on medication, contraceptive devices, rehabilitation devices, diets, as per orders and directions. - Teaching daily living health practices for special conditions as per orders and directions. - Teaching health maintenance, sanitation and disease control practices to families and/or groups. - Making home visits to assess needs of patients discharged from hospital. - Checking on results of delayed reaction tests such as tine test for TB. - Checking charts for proper entry of all items, and results of visits and lab tests.	159, 240, 238, 202, 197, 228, 258, 221, 253, 94, 157, 108, 140, 116	Center training above core level. Linked to advanced standing option in LPN program (lateral).
Level 1[b]: Health Worker Aide - Delivering medicine to patient and explaining how to take as ordered. - Taking partial history from patient on orders. - Teaching patient self exam and care of breasts. - Noticing and reporting relevant patient symptoms to Dr. - Finding out whether family that moved needs to stay with Family Health Team. - Providing orientation tour of facilities and procedures at Center. - Teaching how to bathe and diaper infant. - Teaching how to prepare infant formula as prescribed.	234, 259, 107, 138, 247, 204, 211, 215, 113, 216, 106, 225, 208, 108-140, 155, 97, 196, 223, 75	Core curriculum at Center based on obligatory, rotating tour of duty in Level 1 tasks serving Factors Three, Four, and Five.

[a] Can choose to enter Factor Five or Six Ladder or go on in Four.
[b] All Aides can choose to go on in Factors Three, Four or Five.

Figure 46. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FOUR
(Medical, Psychological and Social Health Maintenance) (Continued)
p. 4 of 4

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 1[a]: Health Worker Aide (continued)		
- Giving general reassurance to any patient.		
- Teaching bottle feeding and burping to new mother.		
- Teaching patient postural drainage technique.		
- Checking patient's medicines and having old ones discarded.		
- Collecting stool specimen and taking to lab.		
- Teaching patient reagent tablet or dipstick urine test on orders.		
- Obtaining urine specimen; preparing for lab on orders.		
- Teaching or collecting specimen for pinworm test on orders.		
- Giving patient enema kit and instructions for use on orders.		
- Making empty bed if needed.		
- Translating conversations if performer knows patient's language.		

[a] All Aides can choose to go on in Factors Three, Four or Five.

a consequent broadening and deepening in the curriculum content required. At this level the major responsibility for planning and coordination would occur in terms of the actual details. The practitioner would coordinate the delivery of services including Team personnel's delivery of service -- rather than coordinate the members of the Team, per se.

There is a laterally related job in child development at Level 4. This is the combination of some of Level 4 in the old Factor Two (pediatrics) with Level 4 in Factor Four. The reason this is possible is that the expanded functions of Factor Four now require the Growth and Development, Psychopathology, Development and Growth of Behavioral Processes of the Individual, Epidemiology, Psychotherapy and Counseling, and Pharmacology required in Factor Two. The old task 88 is expanded so that the Practitioner can supply a fully rounded assessment of development, coordination of physical care (such as shots) and counseling for parents on child rearing problems. This job grows out of Factor Four and can lead back to the more general functions of the factor or to medical or psychological specialties in pediatrics or child psychology.

Level 3 is the first half of the two-person Family Health Worker partnership. The Social Service Family Health Worker does the day to day coordination of services. This job covers orientation and intake,and concentrates fully on the interpersonal relationship with the family and on simple health education. The clinical functions, now in the hands of the Medical Family Health Worker,can be minimized in the curriculum, leaving room for technical training in behavioral development, growth and development, epidemiology, sanitation and preventive medicine. At this level the performer can choose to go on in the general factor or specialize in child development.

At Level 2,the Assistant Family Health Worker is carrying out specific, detailed tasks and is assigned the follow-up and reinforcement of prescribed health practices and health education. The job is truly to assist the Social Service Family Health Worker in servicing the family. Introductory training in many of the factor's subjects would take place at this level,including some clinical practice. At this level the performer has some experience and can choose to go on with Factor Four or specialize on the medical side (Factor Five),or emphasize female care (Factor Six).

The Level 1 tasks serving Factor Four take the performer back and forth from the Center to the home, serving the health education and clinical needs of the family and Team as well as the social service needs. Center curriculum at this level should place the training in a context so that the performer can see where the subject matter leads in terms of the Center functions and future curriculum sequences. The "whys" of procedures should be stressed in preparation for later training, and great emphasis should be placed on developing the Human Interaction, Implicative, Decision Making and Error Consequences skills.

A Ladder in Physical Care and Treatment

The job ladder based on Factor Five (Figure 47) is founded on the proposition that physical treatment tasks require constant practice

Figure 47.

IDEALIZED JOB LADDER FOR CENTER BASED ON FACTOR FIVE (Physical Care and Treatment)

p. 1 of 5

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Levels 5 and 6[a]: Emergency and Introductory Procedures Specialist - Providing emergency life support care for cardiac arrest, poisoning, loss of breathing, hemorrhage, drug overdose, shock, traumas. Also, emergency first aid. - Treatment of injuries on prescription by MD. - Spinal tap (pediatric) on prescription by MD. - Bone Marrow tap (pediatric) on prescription by MD. - Amniocentesis (taking sample of amniotic fluid) from pregnant patient on prescription by MD. - Spinal tap (adult) on prescription by MD. - Suturing lacerations on prescription by MD or own examination. - Cauterization of vagina, cervical biopsy, removal of vaginal polyps, insertion of IUD, correction of retroflexed uterus with pessary, other vaginal care on prescription by MD. - Drawing blood from vein of pediatric patient on MD prescription. - Bone marrow tap (adult) on prescription by MD. - Evaluate whether there are contraindications for physical treatment.	28, 37, 60, 62, 22, 50, 30, 32, 41, 61, 91, 31, 87.	Medical school and clinical training, with special license and advanced standing for MD. Linked below to Physical Treatment nursing specialty. At Level 5 the performer is supervised by MD.
Level 4: Physical Treatment Practitioner - Removing a wart from non-child patient on MD prescription. - Determining if suspect EKG reading is true or artifact(if Level 6 person available for emergency). - Determining allergy to dye for IVP X-rays(if Level 6 person available in emergency). - Incising and draining abcess or boil on MD prescription. - Removing large blunt object from pharynx on MD prescription.	12, 17, 19, 34, 59, 33, 250, 13, 5, 105, 171.	Nursing clinical specialty with cooperation of medical school. Links to Levels 5 and 6 above and nursing program below.

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[a] May choose to train to enter Factor One at Level 5 or Factor Six at Level 5.

Figure 47. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FIVE
(Physical Care and Treatment) (continued)
p. 2 of 5

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 4: Physical Treatment Practitioner (continued)		
- Removing sutures on orders or own assessment. - Conducting routine neonate examination. - Setting up and teaching IV apparatus for non-child patient. - Instillation portion of hysterosalpyngography. - Irrigating, dressing, bandaging wound or burn as judged appropriate to condition. - Assessing urgency of need for MD to see emergency patient.		
Level 3[a]: Clinical Care Nurse and Family Health Worker	38, 18, 112, 156, 218, 192, 167, 133, 251, 243, 57, 117, 143, 92, 119, 232, 118, 58, 104, 109, 191.	LPN or Nurse specialty in clinical care, combined, for Family Health Worker, with orientation at Center. Links with clinical nurse specialty above, and Medical Assistant below.
- Removing foreign object from eye and/or ear. - Drawing blood from non-child patient's vein. - Teaching diabetic patient how to take medication or insulin injection. - Cleaning, dressing, bandaging wounds as ordered. - Assisting in emergency by preparing materials. - Preparing and administering subcutaneous or intramuscular injections on orders and explaining. - Helping any patient in walking. - Conducting routine exam of any patient over six months of age by taking vital signs and noting abnormalities. - Removing foreign object from patient's ear. - Irrigating and changing indwelling catheter. - Obtaining urine specimen from female using catheter. - Removing thread stitches on orders. - Teaching infant's formula, feeding, bathing, diapering to mother.		

[a] Option to train to go on to Level 4 in Factor Six.

Figure 47. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FIVE
(Physical Care and Treatment) (continued)
p. 3 of 5

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 3: Clinical Care Nurse and Family Health Worker (continued) - Teaching patient irrigation of catheter. - Preparing patient with foreign body in eye by applying dye strip. - Administering common range of motion exercise on orders. - Teaching irrigation, change, care of colostomy. - Applying splint on orders.		
Level 2[a]: Medical Assistant - Preparing intravenous bottle. - Changing colostomy bag, irrigating on orders. - Administering prepacked smallpox vaccine on orders. - Assisting in administration of oxygen on orders. - Bathing any adult bedridden patient. - Teaching how to prepare infant formula. - Examining, treating bedridden patient for bed sores. - Preparing materials for special procedures. - Deciding whether to make an occupied bed and making. - Preparing patient for suturing. - Teaching patient temperature taking and care of thermometer. - Preparing patient and taking vital signs before Dr.'s examination. - Applying prepackaged tine test for TB. - Applying hot or cold compress, cold towels, ice bath, or cold water or alcohol rub,or both, on Dr.'s orders. - Irrigating ear with solution as ordered. - Administering rectal medication as ordered. - Carrying out tablet or dipstick urine test.	179, 229, 152, 185, 210, 215, 206, 163, 224, 173, 244, 199, 93, 200, 201, 162, 142, 95, 96, 205, 190, 194, 233, 177, 188, 209, 212, 195, 187, 189, 256, 161, 170, 198, 139, 172, 141, 98.	Cooperation in training between Center and LPN or AA program. Advanced standing on completion in LPN and/or AA program. Linked below with Center core curriculum.

[a] Can choose to enter Factor Four or Six ladder or go on in Five.

Figure 47.

IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FIVE
(Physical Care and Treatment) (continued)
p. 4 of 5

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 2: Medical Assistant (continued) - Taking throat culture specimen; labeling. - Giving patient enema on doctor's orders. - Assisting patient to or from wheelchair. - Administering eye or ear drops on orders. - Teaching pt. how to irrigate eye with water. - Treating patient for ringworm on Dr.'s orders. - Assisting any non-infant patient to bathe, shower, dress. - Applying eye patch on orders. - Giving oral medication to patient; explaining effects, on orders. - Treating patient for lice on orders by shampooing. - Weighing and measuring patient and recording. - Assessing results of tine test. - Taking stool specimen and testing for blood using tablet. - Obtaining clean catch urine specimen.		
Level 1[a]: Health Worker Aide - Preparing food, feeding non-infant patient. - Treating baby for cradle cap. - Assembling suture materials as ordered. - Preparing hypodermic on orders. - Preparing tray for drawing blood; writing labels. - Preparing tray for nasal packing. - Assisting Dr. in medical exam with materials. - Preparing patient for pelvic exam; preparing slides. - Preparing for bone marrow puncture on orders. - Inducing vomiting in patient on Dr.'s orders with medication. - Preparing patient for gastric lavage and assisting.	217, 213, 166, 260, 180, 181, 153, 193, 183, 182, 214, 147, 160, 75, 235, 150, 136, 130, 151, 176, 266, 230, 137, 168, 169, 184.	Core curricula at Center based on obligatory rotating tour of duty in Level 1 tasks serving Factors Three Four and Five.

[a] All Aides can choose to go on in Factors Three, Four or Five.

Figure 47.

IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR FIVE
(Physical Care and Treatment) (continued)
p. 5 of 5

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 1[a]: Health Worker Aide (continued)		
- Shampooing patient with itchy scalp.		
- Escorting patient within institution.		
- Translating conversation if performer speaks language of patient.		
- Checking medications for expiration dates.		
- Judging what supplies are needed and requesting.		
- Checking and storing delivered supplies.		
- Obtaining pharmaceuticals as ordered and storing.		
- Preparing treatment room by cleaning up and stocking supplies.		
- Removing sterilized equipment from autoclave; storing.		
- Locking-unlocking narcotic supplies.		
- Preparing materials for use in a catheter irrigation.		
- Delivering cultures and specimens to incubator or lab.		
- Taking throat cultures to Dr. from incubator, for assessment and collecting Dr.'s assessments of throat cultures.		

[a] All Aides can choose to go on in Factors Three, Four or Five.

because they are heavily reliant on skills such as Object Manipulation, Consequences of Error to Humans, and Figural Skills. The implication of this proposition is that a given task done infrequently by a physician may not be carried out as well as when the same task is performed frequently by a specialist.

Thus, the tasks at Levels 4, 5 and 6 include many that are currently being done by physicians. The education prescribed for these levels will cover the same education needed by physicians to do them, but will not require all the additional knowledge required for diagnostics. The reader will notice that, in every case, it is still the physician who prescribes the treatment. The new performers will be trained to know about contraindications and what to do. Since the ladder also includes emergency care and first aid, the performer will also be able to handle any contingencies which may arise.

The reader may notice that this ladder is not unlike some of the suggestions for "physician assistant." This title has been consciously avoided, since it is not the physician, per se, who is being served, but the patient; and it is the institution which determines the functions and educational preparation. The performers are members of an interdependent staff, and are not simply "assisting."

Level 5 provides for supervision in the tasks of Level 6, so that clinical practice in the advanced tasks has a period similar to that of internship or residency. The major difference is that the performers at Level 5 have already had the practice and clinical experience in the related, lower level tasks of Level 4.

The Level 3 job is the second half of the Family Health Worker partnership. The Clinical Care Nurse and Family Health Worker coordinates with the Social Service Family Health Worker, but is also involved in service at the Center, perhaps on a rotating basis. This keeps the skills sharpened, provides for some continuity of clinical attention for the patient, and gives the performer an awareness of home problems in relation to clinical services.

At Level 2 the Medical Assistant can shift from the home to the Center, providing continuity of clinical attention and allowing the performer to make a choice in continuing up into the ladders for Factors Four, Five or Six.

The Level 1 tasks serving Factor Five are primarily carried out at the Center, but the tour of duty in the other factors and the core curriculum will prepare the performer for the home experience.

The jobs above Level 3 in this ladder are contingent on the ability of the cooperating educational institutions to build compatible curriculum ladders or to adapt current programs. The objective is that, by Levels 5 and 6, the specialist in this ladder should have a good deal of advanced standing in a medical school.

A Ladder in Machine Related Care and Radiology

The ladder based on Factor Three is shown in Figure 48. Unlike the other three ladders, it cannot be climbed unless the performer is

Figure 48.

IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR THREE
(Machine Related Care and Radiology)
p. 1 of 3

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 6: Diagnostic Radiologist - Reading, assessing X-rays and fluoroscope film and making recommendations. - Answering MD questions about radiographs.	6, 8	Leads to professional Radiologist treatments. Possibility that MD could receive diagnostic training. Linked to professional roentgenography below.
Level 5: Center-Type Professional Roentgenographer - Fluoroscopy of lower intestinal tract. - Fluoroscopy of upper GI tract. - Fluoroscopy portion of hysterosalpyngography. - Assessing performance and output of X-ray workers. - Reading and interpreting "stat" X-rays on request.	1, 3, 4, 7, 20.	Professional level program in conjunction with medical school subjects, and building on advanced radiologic technology.
Level 4: Hospital-Based Advanced Radiologic Technologist - Advanced or specialized X-ray taking. - Therapeutic uses of radiologic technology at technician level.		Advanced radiologic technology (2 years). Linked to Level 5 above and first half of program below.

Figure 48.

IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR THREE
(Machine Related Care and Radiology) (continued)
p. 2 of 3

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 3: Center-Based, Jr. X-ray Technician - Preparing patient and barium drink for fluoroscopy and taking upper GI X-rays. - Taking lower GI series X-rays and scout film. - Taking X-rays with vertical or table X-ray machine. - Taking IVP X-rays after allergy test. - Assessing quality of radiographs.	68, 67, 65, 66, 81.	First half of radiologic technology (1 year)
Level 2: Machine Related Technician - Reassuring patient about X-ray or EKG procedures. - Re-explaining pre-X-ray home procedures to pt. - Preparing patient and taking electrocardiogram. - Demonstrating and explaining EKG. - Giving vision screening tests (Keystone and Snellin). - Calling repair company re X-ray or EKG equipment. - Preparing barium enema. - Checking and caring for equipment. - Deciding if EKG reading looks suspicious and informing appropriate person.	73, 74, 262, 270, 257, 99, 82, 79, 132, 271.	Special Center training in procedures with emphasis on connection between pathological conditions, symptom manifistations, and handling.
Level 1[a]: Health Worker Aide - Developing radiographs using hand developer. - Preparing radiograph packet for interpretation. - Cutting and mounting an EKG strip. - Checking level of developer and fixer solution. - Preparing materials for IVP-dye allergy test. - Readying treatment room by wiping up and cleaning. - Preparing equipment for autoclave by washing and wrapping.	71 78, 263, 272, 80, 135, 145, 175, 178, 149, 174, 70, 2, 268, 72, 269, 267, 223, 69, 222, 144, 146,	Core curricula at Center based on obligatory rotating tour of duty in Level 1 tasks serving Fac-

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[a] All Aides can choose to go on in Factors Three, Four or Five.

Figure 48. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR THREE
(Machine Related Care and Radiology) (continued)
p. 3 of 3

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 1[a]: Health Worker Aide (continued)	273.	tors Three, Four,and Five.
- Sterilizing equipment in hot water sterilizer by washing, placing, wrapping, and storing when removed. - Preparing hand developing tank for X-ray film. - Loading or unloading film in fluoroscopy machine. - Checking EKG paper and putting in new roll. - Loading X-ray film cassettes. - Deciding whether repair is needed for EKG machine. - Routine cleaning and dusting of machines. - Using automatic developer for X-ray and spot films. - Duplicating forms on duplicating machine. - Preparing hot water sterilizer for use. - Setting autoclave. - Turning on X-ray film developing machine.		

[a] All Aides can choose to go on in Factors Three, Four or Five.

allowed to move into the hospital setting. This is because the tasks at Level 4 and Level 7 would not normally be found at a Center.

The assumption that the Radiologist is a physician with additional training is somewhat in question in the ladder. It is suggested that a direct route, with a major portion of medical school training, may be sufficient. The tasks represented in the jobs up to and including Level 5 do not appear to need all the training now given the Radiologist.

It is suggested that Level 4 tasks at the hospital may require the currently mandatory (in New York) two years of training and state licensure. However, there should be an exit point after 6 months or a year for the Level 3 job, and these two portions of the program should be additive, so that the performer at Level 2 can go on to Level 3 by taking the additional training.

The Level 2 tasks include introducing the patient to X-ray procedures and work in EKG and eye tests. Such training is now provided by institutions themselves or by special programs. To cut down the time needed in Level 3 training, the Center's curriculum should be designed with the Level 3 training in mind. Curricula such as Topographic and Regional Anatomy, Pathology, and Handling and Transportation of the Sick or Wounded could be carried over to Level 3 as was indicated in Chapter 4.

The Level 1 tasks represent one of the three tours of duty for the Health Worker Aide and encompass what is now the job of the Dark Room Aide and many of the lower level machinery-related functions of the LPN, Medical Assistant and X-ray Technician. This provides the variety needed as well as an orientation to many functions which the entry level worker might otherwise miss.

A Ladder in Female Care

The rationale for the Female Care ladder (Figure 49) is not simply that the tasks happened to cluster. A more important consideration has emerged as a result of the factoring. The reader may have noted that the knowledge categories covered by the factor, and the tasks that clustered there, go beyond the usual Obstetrical-Gynecological tasks, but exclude the clearly physician level diagnosis and surgery. What is included in the ladder and excluded from the usual function of the Obstetrician-Gynecologist is the deeply sensitive counseling and guidance that women need in dealing with their bodily functions during puberty, sexual activity, the fertile period, pregnancy, post-partum, motherhood, menopause, and the aging process.

A woman's changing needs are not just a straightforward choice of a contraceptive, diagnosis of vaginal discharge, venereal disease, choice of abortion or birth, and correction of physical abnormalities. A woman needs to be able to talk about her changing functions in relation to her wants and desires, and must be able to understand herself and the full meaning of the choices open to her. She needs to know what choices _are_ open to her. All these needs are more urgent today, coming at a time when there is a growing insistance from women that they have a right to control their own bodies.

Figure 49.

IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR SIX
(Female Care)
p. 1 of 2

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 5: Female Care Specialist - Normal delivery of baby, provided Dr. is available to handle complications. - Providing fertility assistance, except for andrometric biopsy. - Prenatal examination of patient; evaluating condition; prescribing standardized routine care or referral; conferring with MD on abnormalities. - Post partum examination of patient; evaluating condition; prescribing standardized routine care or referral; conferring with MD on abnormalities. - Neonate examination; evaluating condition; prescribing standardized routine care or referral; conferring with MD on abnormalities. - On prescription of Dr., cauterizing, removing polyps, inserting IUD, providing other supervised vaginal care.	Modified 43, modified 42, 86, 85, 89, modified 41, 248, 249.	Medical school and clinical training, with special license and advanced standing in MD program. Linked below to Female Care nursing specialty.
Level 4: Female Care Practitioner - Counseling on sex, contraception, pregnancy, VD, abortion, female disorders. - Instructing in techniques of sex, contraception, female care, after-care in pregnancy, abortion, surgery. - Giving basic education in sex, adolescence, contraception, menopause, VD, abortion, pregnancy, growth and development of fetus and neonate. - Pap and pelvic examination of adult female patient including specimens; evaluating condition; conferring with MD on abnormalities. - Instillation portion of hysterosalpyngography.	101, 84, 5, 11, 202, 226.	RN specialty to link with specialty above and with adapted LPN training below.

Figure 49. IDEALIZED JOB LADDER FOR CENTER
BASED ON FACTOR SIX
(Female Care) (continued)
p. 2 of 2

General Functions and Level	Code Nos. of Current Tasks	Comments on Curricula
Level 3[a]: Female Care Technician - Reinforcing patient in use of contraceptive. - Measuring, fitting diaphragm for female patient. - Determining presence of monilia fungi on slide. - Examining a slide for gonococci. - Obtaining urine specimen from female using catheter. - Determining presence of trichomonas on slide. - Irrigating and changing indwelling catheter. - Teaching irrigation of catheter in home. - Teaching patient self exam and care of breasts.	258, 103, 51, 16, 143, 15, 117, 118, 107.	Adaptation of LPN training to build on Level 2 training in Center for Factor Four, or LPN program for Factor Five.

[a] This level reached from Factors Four or Five from Level 2, with appropriate training provided.

This means that the Obstetricial-Gynecological functions are both too narrow for the patient's needs and too advanced for the non-physician. The job ladder for Factor Six provides for a three-level sequence in which non-surgical examination and treatments are combined with life-oriented counseling and education. The ladder builds on the base provided by Level 2 jobs in Factors Four or Five, and can go on to Obstetrics-Gynecology with advanced standing in medical school. Set in this framework, it makes it possible for women to rise in this area and to service patients with sympathetic understanding as well as technical skills and knowledge.

CHAPTER 7

POLICY IMPLICATIONS

Chapters 5 and 6 are specific with respect to their implications regarding job structures and curriculum design. However, some more broadly based questions still remain to be discussed. The first section of this chapter deals with conceptual issues regarding the functioning of the Family Health Team at the Center. The next section covers issues and concepts in the area of curriculum design, and the last section presents some comments on institutional change. The chapter ends with a note about the Health Services Mobility Study.

COMMENTS ON THE FAMILY HEALTH TEAM

The pilot test at the Dr. Martin Luther King, Jr. Center was stimulating, not just because of the excitement involved in testing the method; the Center itself generates interest because of its innovative methods and the dedication of its staff. Because we feel involved, this section is offered for whatever possible positive inputs it may make to the Center's own thinking about the role of the Family Health Team and some of the Center's functions. The ideas and impressions presented here are a by-product of the task analysis work and stem from the type of contact made possible during the research period at the Center.

It is interesting to note that the word "team" is not well defined in the dictionary. Its technical denotation is little more than the association of a number of persons or the harnessing of two or more persons or animals to the same vehicle. "Teamwork," however, refers to work done by a number of associates all subordinating their personal prominence to the efficiency of the whole. It follows that there is no teamwork or team unless each member's function is necessary for the work; no team unless all performers necessary are included; and no teamwork unless the work to be done can be done by the team, and unless it is possible for personal prominence to be subordinated by virtue of the way in which the work is done.

The first concern which might be raised is with respect to the work objectives of the Team. If the goal is to coordinate the services provided, and if the services are to include the medical, psychological and social needs of the family, then the Team seems to be somewhat truncated as it is currently organized. As the discussion in Chapter 6 on the job ladder based on Factor Four indicated, the current composition of the Team and its included tasks seems to omit the types of jobs that would focus on the social-psychological life of the family, to which medical care is an adjunct.

It may be that the real issue is that there should be no artificial barriers separating the Mental Health Center and the Community Health Center. At the moment these are separate entities funded through separate Federal agencies. It may be that what is needed is a massive policy change which would make it possible for an entity such as the Center to truly provide comprehensive health maintenance and care in a combined operation.

If this is not the problem, and if the missing functions are indeed being carried out by other titles at the Center (such as psychiatrist, social worker or similar designations), then their absence from the Team would appear to be a serious omission.

A second concern which might be raised deals with the relationship of the Team to other functions at the Center. The reader may have noted that the ladders in Chapter 6 made it possible to move from work located in the family's home, to the Center, and back. But, beyond this, the question is raised that the family might be better served if the workers in the Unit were as intimately involved in participation with the Team as are current Team members. One would assume that continuity of attention is also desirable in connection with conditions which bring the patient to the Center for care. The jobs designed in Chapter 6 are more oriented towards joint participation in the Team.

A third concern lies in the relationship between the expressed desires and goals for the delivery of care and the practical expression of such concerns in job performance. There seems to be a belief that the orientation given staff about the objectives of the Team and the Center is enough to bring about the performance needed to attain the objectives. Institutional performance evaluation would be warranted to evaluate the extent to which the objectives are being met. We raise the point that it cannot be assumed that a goal or objective is being achieved unless the institution can point to the means of achieving the goals through their embodiment in tasks. The outputs that reflect the goals must be the result of tasks. The standards of performance that reflect the goals must be reflected in skills and knowledge required at appropriate levels. There are no other places to look for the expression of goals.

A fourth concern deals with the work assigned to Teams and the nature of the work allocations to the Teams. The institution will do well to reconsider which types of tasks are enhanced by having their performers in a Team and which are not appropriate to Team jurisdiction. On the other hand, it is hard to imagine a team working properly unless its members are interdependent. It appears that, currently, many of the tasks performed by the Family Health Worker are subject to being redone by the Nurse Practitioner whose tasks are, in turn, subject to being redone by one physician or another. The performer whose work is redone does not develop a full sense of participation and does not have the opportunity to develop responsibility and decision making skills.

It may be that the higher-level Team members do allocate responsibility, but this becomes a privilege of upper-level titles which must be policed to be sure it is being carried out. The excuse that lower-level members are "not ready" can easily be overused, especially when there are no formal means of assessing readiness.

The alternative is to have tasks which are so unique to title that the upper-level titles are dependent on lower-level titles for some outputs, as well as the reverse being true. There is no better way to ensure efficient output than to have a co-worker depend on it for the performance of his own tasks. The ladders represented in Chapter 6 are an attempt to provide that type of interdependence.

It might be added that a program of upward mobility enhances and becomes an incentive for efficient performance when upgrading is partly dependent on the quality of current level performance.

The Team concept is a good one if its conceptual implications are considered, and if it is treated as a mechanism for the delivery of service rather than an end in itself. It has already shown itself to be a viable structure. Our hope is that it will be developed in the direction of its strengths.

PERFORMANCE EVALUATION AND CURRICULUM DESIGN

The possibilities of designing educational functions to meet community needs are extremely exciting, even if they are not the most likely way in which career ladders will evolve. This section presents a brief outline of the events to be anticipated in and planning for job functions and related education. It is addressed primarily to health care institutions and health manpower educators who are concerned about the methods of implementing innovative change cooperatively.

The institution providing the health care and the institution providing the education for the manpower involved will, with the community, be embarking on a joint venture to deliver the type of care that is wanted, including how it is to be delivered and the quality of attitude and approach to be demanded of the practitioners. From these discussions will emerge a set of goals and priorities. At this point, two sets of very specific statements would be needed:

1. Statement of the health services to be delivered.
2. Statement of the general educational objectives to be achieved in training manpower to deliver the services.

The statement of health services to be delivered would be translated into normative task statements. These would include existing tasks for which HSMS-type task data had been collected. The tasks would be subjected to performance evaluation to make them acceptable in terms of the objectives.[1]

In addition, the institution would identify the tasks not yet in existence, but which would be required in order to provide all the services represented on the statement of health services. The idealized ladders of Chapter 6 include such tasks. The HSMS task identification procedure could be used to describe such idealized tasks. The application of the task definition (with existing task statements used as examples) would provide a concrete set of data similar to existing task data. It is essential to realize that the new objectives and attitudes to be achieved can be expressed in terms of elements within tasks. For example, taking account of a patient's social situation can be expressed as a task element.

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[1] The HSMS methodology provides sufficiently detailed and standardized information to assist with such needs. This application of the HSMS method is described in Research Report No. 6, mentioned at the end of Chapter 1. Use of the HSMS data for evaluating institutional performance would be a logical concomitant of any institution's plans to implement a full-fledged upgrading program involving a restructuring of jobs. Such commitment provides the opportunity for reevaluating institutional performance in relation to goals. The methodology described in Research Report No. 6 provides the institution with a means of evaluating whether it is producing the outputs it wishes, in the best ways possible and to ascertain, using its own standards, whether performance of tasks meets its standards. The document also shows how the HSMS data make it possible to locate the tasks which are not being done well and to pinpoint the skill and knowledge areas which are responsible for the performance problems.

Similarly, the skill scale requirements reflect the human qualities, responsibility, and judgmental standards of behavior to be attained. The existing tasks could be evaluated to be sure that the skill and knowledge data properly reflect desired content and at appropriate scale levels. (This is described in Research Report No. 6.) The new, idealized tasks would be treated similarly. The entire set of task data would then represent all the tasks needed to provide the list of services as determined by the objectives. These would be assembled in the type of job ladders described in Chapter 6, using similar methods.

Thus, the new jobs in the idealized ladders would be created (or redesigned) by combining tasks in the same skill and knowledge families which are at similar levels in those families. Added to these would be the tasks required to facilitate the procedures, such as dealing with supplies or planning work. The restructuring could clearly not go on in a vacuum. Existing practitioners and administrators would be consulted.

The Curriculum Unit

The design of curriculum sequences, any attempt to eliminate overlap or redundancies, and any attempt to eliminate unnecessary curriculum content requires a unit of analysis on which analysts can independently agree. This means that a curriculum unit must be operationally defined.[2]

The literature on behavioral objectives in education places curriculum design into a framework which acknowledges that it must be consistent with educational objectives. Curricula are conceived in terms of the activities which must be displayed by the learner in order to demonstrate that the learning has taken place. As a result, the content learned, the application of the content, and the method of presentation must be functionally related in the original conception of the curriculum. The educational objective and the curriculum are translated into behavioral objectives.[3] The HSMS preliminary definition of the curriculum unit is as follows.

The curriculum unit represents the subject matter to be imparted to the student in order for the student to be able to demonstrate his mastery of a cohesive, interrelated set of ideas and/or procedures. The curriculum unit is expressed in a behavioral statement similar to an Informational Objective,[4] and has the following characteristics:

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[2] This means that, given a course of study, different analysts using the same definition will fairly closely agree on the identification of the curriculum units involved. Having found no such unit currently defined in the literature, the Health Services Mobility Study attempted to develop a working definition which could be used to meet the objectives stated. This work is described in Working Paper No. 10, reffered to in Chapter 1. Some of the contents of that document are discussed here to provide a frame of reference for the reader.

[3] "Behavioral objectives," as used by educators, are expressed in statements which indicate what learners are expected to do or will do on successful completion of a prescribed unit of instruction.

1. The behavioral objective must have self-evident and independent meaning; it must be comprehensible without the statement of other behavioral objectives. (Otherwise it is too small.)

2. The behavioral objective must be able to be stated briefly, such as in a paragraph. (Otherwise it is too large.)

3. The behavioral objective should require the student to learn a somewhat complex, interrelated set of procedures and/or skills and/or ideas which can be demonstrated. (Otherwise it is too small.)

4. All the subject matter contained in the curriculum unit must be necessary for the demonstration of mastery of the behavioral objective, and all its contents must be logically related. (Otherwise it is not cohesive.)

5. It must be possible to convert the behavioral statement into a Planning Objective statement by the addition of a statement concerning the conditions of demonstration and the criteria for evaluation of the mastery of the content of the behavioral statement.[5] (Otherwise it is too large.)

6. It must be possible to relate the curriculum unit to a general educational objective.[6] (Otherwise it may be irrelevant.)

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[4] An "Informational Objective," as used by educators, describes the behavior which a learner will have to employ to demonstrate his mastery of the informational and/or skill content of the objective.

[5] A "Planning Objective," as used by educators, (1) describes the behavior which the learner will have to employ to demonstrate his mastery of the informational and/or skill content of the objective; (2) it describes the conditions under which the behavior is to occur; and (3) it describes the criteria which are to be used to evaluate the learner's mastery.

[6] A "general educational objective," as used by educators, states the nature of the broad subject area involved in an educational program and indicates the type of behavioral goal to be reached in relation to it.

7. It should not be possible to divide the behavioral statement into still finer Planning Objective statements which could also fulfill the criteria listed here for behavioral statements. (Otherwise it is too large.)

8. It should not usually require the content of an entire course to make it possible to achieve the behavioral objectives of the curriculum unit. (It usually would mean it is too large.)

The definition presented above and the eight standards for its application are presented to the reader as the first tentative effort at an operational definition of the curriculum unit. At this writing it has not yet been field tested for reliability, nor has a manual been designed for curriculum unit identification similar to the field manual for task identification.

Curriculum Design

The use of curriculum units is nowhere more needed than in the setting being described here. The crucial strength in the curriculum unit is its ability to clearly articulate and relate learner activities, anticipated outcomes, job objectives, and general educational objectives. In addition, the teaching method then becomes an integral and an absolutely necessary part of the curriculum design.

The relationship between the statement of health services and the statement of general educational objectives will be expressed in the elements of the tasks, and should be expressed in the behavioral statements describing the curriculum units.

If one of the goals of the institution is to provide responsive and relevant care, the general educational objectives will have to include the development of knowledge and awareness of the population to be served. The tasks should have elements to reflect this, and the behavioral statements for curriculum units will have to include a demonstration of such awareness.

The curricula can be specifically geared to draw on the interrelationships of skills and knowledge, and can utilize the different knowledge areas to specifically develop the skills. The skills can be used to develop the understanding of the knowledge. If the teaching methods emphasize the direct teaching of skills as well as knowledge, both needlessly long and unduly inadequate training could be eliminated to an extent not yet imagined.

Informational Objectives and curriculum units which are common requirements for a number of jobs can be offered to students preparing for various jobs in a ladder or several different jobs in a lattice. Once they are identified, they can provide the basis for efficient use of time and for enrichment of students' experience through exposure to co-workers in different but related activities.

The job ladders will provide exit points along the way for practice. Thus, in the next learning sequence as the individual rises the prior learning is reinforced and added to. All this presupposes that the educational methods will emphasize and amplify the additive nature of the learning and will not provide the training in discrete, disconnected units.

INSTITUTIONAL CHANGE

Social pressures have been an impetus toward the development of upward mobility programs. But, only if there is a functional incorporation of upward mobility into the institution's manpower structure will the pressures be satisfied. One-shot, one-step upgrading programs have proven themselves inefficient, short-lived, and have themselves become sources of frustration. They have created and then failed to fulfull the just aspirations of loyal workers who provide a huge dedicated core from which to draw in the provision of health services.

Once an institution is commited to upward mobility as a continuous part of manpower administration, it must be aware that this requires planning the means for implementation. The design for upward mobility through job ladders or lattices is like the creation of a railroad. The flow of trains can be directed to suit the needs of both the institution and the individuals involved, but the tracks must first be put into place.

We have found that the implementation of a career mobility approach necessitates changes within the institution such as the coordination of recruitment, training plans, and upgrading pathways with the operations of the institution. Planning and a redirection of focus may be needed. No amount of commitment at high management levels can substitute for the involvement of middle and lower line personnel in the implementation of institutional change. The greatest enemy of a viable mobility program is staff ignorance of what is happening.

For this reason we believe that the issues of upward mobility should be discussed at every level of an organization and in cooperation with employee organizations where they exist. It should be noted that persons are less resistent to upward mobility for others when they have avenues open to themselves as well. Thus, a career ladder or lattices linking entry-level jobs through graduated sequences to the very highest professional and administrative jobs is most desirable if maximum support is to be enlisted. On such ladders even high-level employees can move up. However, such true career ladders require the greatest amount of rethinking with respect to manpower planning and implementation.

The reader will by now have become aware of the large number of external obstacles that make the implementation of career ladders seem a distant goal. It is hoped that this document will have helped in the provision of some of the detailed methodology needed for designing the ladders and the curricula.

There remains the need to enlist the willingness on the part of many institutional employers, educators, and employee organizations in order to eliminate some of the institutional barriers. These include rigid certification and licensure barriers, the red tape connected with having new curricula approved, and the bureaucratic impediments to accepting new jobs. It should be pointed out, however, that the greatest obstacles collapse when the coordinated efforts of large-scale employers are joined with major educational institutions and employee organizations. Thus, the full weight of a municipal hospital system or a federation of voluntary hospitals, combined with the force of a major trade union, and joined by a major educational complex can be sure it can effect changes in state licensure requirements when such requirements can be shown to be less than rational.

It would appear that the act of sitting down together for such purposes is rarer than any defeats stemming from such attempts. The vision of three or four levels of curriculum planners devising ways to ensure continuous educational programming is less irrational than it is unfamiliar.

We would also urge that Federal legislation, which has begun to move in the directions discussed here, aid in bringing about the changes needed by rewarding such efforts through the types of educational projects that are given priority in funding. There is still the need to find means to finance release-time training of employed adults. There is still the need to arrange such funding in a way that does not require the institution to go to a different Federal agency for each level on a ladder.

As a matter of fact, the health care industry would benefit from less organizational fragmentation at a Federal level with respect to health manpower. For example, as the National Institutes of Health is now structured, "Allied Health" is legislatively defined to include a very restricted set of occupations, and cannot overlap with the jurisdications in nursing or physician manpower. Any true career ladder will probably cut across all three jurisdications. There would be great benefit in legislation which permitted multiple agency involvement.

A NOTE ABOUT THE HEALTH SERVICES MOBILITY STUDY

This document reports on the first pilot test conducted by the Health Services Mobility Study. The document must itself now be tested. It is important for us to know whether the results reported here are considered relevant, useful and generalizable. If they are, then it would be worthwhile for the Study to continue to apply the method in other areas and to report the results. These are now the plans for the coming year. You, the reader, can help to determine whether that will be a useful direction by the degree to which you make use of the Report and to the extent you tell us about it. We would like to hear from you.

APPENDIX A

BASIC DATA TABLES

A.1 Extended Task Names By Code Number A-1
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Table A.1 EXTENDED TASK NAMES BY CODE NUMBER
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Task No.*	Task Name
1	Performing fluoroscopy of any patient's lower intestinal tract, by deciding if "scout film" shows clear tract; reassuring patient; supervising X-ray technician in administering barium enema; setting and using fluoroscope machine, observing lower intestines on monitor; deciding on and taking spot films, watching out for bowel puncture and arranging to hospitalize if necessary; specifying to X-ray technician in detail any special X-rays to be taken; recording observations.
2	Deciding whether to load 70 mm. film in fluoroscope machine: loading roll of film into photographic attachment on fluoroscope machine by inserting new spool of 70 mm. film, threading into machine part, closing, and advancing film to compensate for any exposure to light;unloading exposed roll and placing for developing.
3	Performing fluoroscopy of any patient's upper gastrointestinal tract, by reassuring patient, supervising administration of barium drink; setting and using fluoroscope machine; observing upper gastrointestinal tract on fluoroscope monitor; deciding on and taking spot films; specifying to X-ray technician in detail any special X-rays to be taken; recording observations.
4	Performing fluoroscopy portion of hysterosalpingography on any adult female patient, by reassuring patient; supervising the instillation of roentgenopaque (hypaque) solution into uterus and uterine tubes by second radiologist; setting and using fluoroscope machine; observing condition of organs on monitor; deciding on and taking spot films; specifying to X-ray technician in detail any special X-rays to be taken; and recording observations.
5	Performing instillation portion of hysterosalpingography on any adult female patient, by reassuring patient, inserting sterile vaginal speculum, inserting sterile cannula, using sterile tenaculum, through cervix into uterine cavity; instilling roentgenopaque (hypaque) solution on orders of second radiologist; removing equipment when indicated.

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* Tasks with asterisk appear for more than one of the 12 titles studied.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
6	Reading, interpreting and making recommendations based on newly developed (and old) radiographs and/or spot films; reporting findings, conclusions and recommendations based on readings and notes; dictating and placing for secretary to type, and, on request, reporting orally; assessing quality of film for later discussion with subordinate.
7	Informally assessing performance and output of X-ray technicians and dark room aides; discussing errors and explaining correct procedures and/or demonstrating; deciding whether to informally report consistently bad performance to X-ray supervisor and/or Medical Director; doing so.
8	Answering physicians' questions about interpretation of radiographs and spot films by phrasing answers so that they educate the questioners and are specific to examples presented.
9	Diagnosing any non-child patient's medical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, results of tests and X-rays, examining physically, discussing symptoms; and deciding on referrals or tests, X-rays, or care, and/or delegating and ordering care, treatment, medications, prescriptions, follow-up; discussing with patient; recording on patient's chart.
10	Deciding on whether to carry out a prescribed course of treatment, care or medication for any non-child patient, and/or changing or approving renewal of prescriptions, by reviewing prescribed care, examining present condition, discussing progress and symptoms with patient; deciding to administer medication or care or to have it done by subordinate; ordering medications, materials and/or administering medications, observing relevant reactions; recording on patient's chart.
11	Performing a routine pelvic examination on any adult female patient; taking samples for Pap and/or gonorrhea test; recording on patient's chart and Pap smear (cytology) form; having Pap smear slides prepared and/or preparing Pap smear slides and/or GC culture for lab.
12	Removing a wart from any non-child patient, by use of scalpel and/or electrodesiccator - fulgurator, local anesthetic; deciding whether to have specimen analyzed for pathology; if so, cutting specimen and preparing for analysis, by putting it in preservative and filling out report; recording on patient's chart.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
13	Setting up an intravenous apparatus for any non-child patient and instructing patient's family members by preparing bottle(s) of prescribed solution, inserting the IV needle into patient's vein and regulating the flow; instructing family members and/or subordinates in how to regulate flow, change bottles and remove apparatus; recording on chart.
14*	Evaluating a prepared skin specimen slide for presence of mycelia (fungi) by adding KOH solution, heating over flame, and examining slide under microscope; and recording findings in patient's chart.
15*	Determining the presence of trichomonas protozoa in a prepared fresh slide of vaginal secretion, by examining under microscope while still fresh; recording findings in patient's chart and/or lab slip.
16*	Examining a slide prepared with penis or vaginal discharge by heating over flame, applying stain using Gram's method, and examining under microscope for presence of gonococci (gonorrhea); recording findings in patient's chart.
17*	Evaluating (EKG technician's) suspicious EKG readings of any patient to determine whether they are caused by a true health dysfunction or are mechanical or electrical artifacts; taking appropriate action, such as adjusting equipment, caring for patient, summoning emergency care; informing patient's Dr.;recording care given.
18*	Drawing blood from any non-child patient's vein and filling test tubes or vacutainers with appropriate blood samples; labeling or having labeled and/or brought to lab; arranging to have co-worker obtain sample from hard to find vein if necessary; recording on patient's chart.
19	Deciding whether to administer radiopaque solution for IVP (X-ray of kidney and ureter), by questioning patient about allergy to iodine, history of asthma; and/or injecting and watching reactions to 2 cc. test injection; if ok, injecting full amount of radiopaque solution; standing by for delayed adverse effects; telling lab technician when to go ahead with IVP. If adverse effects, administering emergency care; informing patient of allergy; recording on patient's chart.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 4 of 35

Task No.*	Task Name
20*	Reading, interpreting and diagnosing an emergency ("stat") X-ray at request of Dr. ordering it; recording on X-ray request form, and having it sent to Dr; informing Dr. of interpretation and diagnosis.
21	Informally providing training in patient care procedures, skills, and knowledges for an intern or resident in internal medicine, by demonstrating and/or explaining and/or observing intern or resident and explaining errors when requested by intern or resident.
22	Responding to a call for emergency assistance in the cardiac arrest of any patient by cooperating with other physicians and staff to take emergency action such as insertion of endotracheal tube, performing tracheostomy; administration of artificial respiration and oxygen; providing cardiac massage; taking EKG and applying defibrillator, injecting intracardiac stimulant; providing IV infusion; arranging to hospitalize patient.
23*	At request of patient, co-worker, patient's family or institution, filling in agency or school forms and/or writing letters describing or evaluating patient's medical condition and/or medical or social history, based on patient's chart and Dr.'s knowledge of patient's condition; having letter typed, signing; having letter posted.
24*	Assessing the urgency of follow-up appointments for patients who have not showed up for visit to performer (Dr.), recording; planning personal follow up with Family Health Worker, and/or LPN (Subordinates) if considered necessary,or having secretary arrange new appointments if considered necessary.
25	Contributing to Family Health Team conferences by suggesting patients, planning for, assembling materials for, and making presentations to; contacting patients,leading or participating in discussion on patient's problems, based on experience as internist; helping to arrive at decisions on care; participating in discussion of Team functioning, based on experience as internist on Team; recording.
26*	Participating in committee work at Center dealing with health procedures and practices or institutional policy, by selecting or being invited to join committees of personal or professional (physician) interest, carrying out committee work through discussion, research, writing, gathering information or views of other coworkers, helping to arrive at recommendations, and/or disseminating results to appropriate co-workers.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)

p. 5 of 35

Task No.*	Task Name
27*	Planning and presenting lectures on prescribed subjects in patient care and medicine to subordinate staff and/or students studying for health care jobs, by deciding what should be presented, planning outline and method of presentation, assembling instructional materials, and presenting lectures; being sensitive to response at time of delivery of lectures.
28*	Determining whether a patient requires immediate emergency care; deciding whether to call ambulance and what immediate life support procedures to administer; applying procedures covering loss of breathing, cardiac arrest, hemorrhaging, poisoning, drug overdose, shock; deciding on splinting of serious fractures.
29*	Informally instructing health care subordinates in patient care activities, by demonstrating and/or explaining, using materials normally used in the course of carrying out the task being used for demonstration; deciding who to teach, what to teach, when to call in subordinates, when to have a group session for instruction and how to teach.
30	Taking a sample of spinal fluid from any non-child patient by ordering materials, having patient prepared, injecting local anesthetic, inserting needle into subarachnoid space, taking pressure with manometer and recording, drawing up fluid into syringe, examining fluid and deciding if emergency hospitalization is necessary, taking and recording fluid pressure again; arranging to have lab tests done;and recording on patient's chart.
31	Taking a bone marrow sample from any non-child patient by ordering materials, having patient prepared, injecting local anesthetic, inserting bone marrow needle and drawing up marrow into syringe; arranging to have lab tests done and recording on patient's chart.
32*	Suturing any patient's small open wound by injecting local anesthetic, deciding on number of stitches, knot, suture material, needle; sterilizing; sewing; providing shots, instructing on daily visits, and notifying Health Department if human or animal bite; explaining home care to patient or accompanying adult; recording in patient's chart.
33*	Removing a patient's sutures using antiseptic, clamp, scissors, forceps; evaluating healing; deciding on and ordering antibiotics, medication, irrigation and/or bandaging; recording on patient's chart.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 6 of 35

Task No.*	Task Name
34*	Incising and draining any patient's external abscess or boil, using topical anesthetic, antiseptic, lancet or scalpel, and deciding on medication, packing, dressing and bandage; recording on patient's chart.
35*	Determining the presence of organisms or abnormal conditions in spun-down urine sediment and supernate by spinning urine sample in centrifuge, preparing slide and examining under a microscope; testing supernate for chemical content, using tablets or dipstick; measuring specific gravity of supernate; deciding on nature of findings; recording findings and conclusions on patient's chart.
36*	Observing patient's blood sample under microscope and determining condition, by dropping and smearing blood on slide, applying appropriate stain, examining under microscope, and recording findings on patient's chart.
37*	Caring for any patient with injury such as lacerated wound, fracture, sprain, burn or bleeding nose, by deciding on procedures and materials; using sterile procedures if appropriate, and cleaning, applying butterfly adhesive, medication, sterile dressing, splint, tape, bandage, packing, sling, as appropriate; prescribing antibiotic or pain killer if appropriate; explaining care to patient or family member including care of injury, use of medication, crutches, other aids,signs of infection. Arranging follow-up; recording.
38	Removing a foreign object from any patient's eye or ear, by using magnification lens and reflected light to locate, and eye anesthetic and applicator stick to remove object from eye; head mirror and ear speculum to locate, Zephiran solution to lure live object from ear, or flushing with ear syringe or using forceps with ear speculum and mirror to remove object from ear; recording on patient's chart.
39	Diagnosing any female patient's gynecological or obstetrical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, results of tests, EKG, X-rays; examining physically; taking smears or cultures; discussing symptoms; deciding on referrals, tests, X-rays, treatment, care, or procedures; and/or delegating and ordering care, treatment, medications, prescriptions, follow-up; discussing with patient; counseling on self-care; recording on patient's chart.

Table A.1 EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 7 of 35

Task No.*	Task Name
40	Deciding whether to administer, change (and/or approve renewal of prescription for) medication for female patient, by reviewing RX, chart, present condition, discussing progress and symptoms with patient; deciding to administer medication or to have it done by subordinate; ordering medications, materials; administering medication by intravenous, intramuscular or subcutaneous injection, or by inserting in vagina or rectum; observing reactions; recording on patient's chart.
41	Providing prescribed intra-vaginal treatment or care for any female patient, by reviewing prescription, present condition; deciding to go ahead or change procedure; cauterizing using electric cauterizer; doing punch cervical biopsy; inserting IUD using betadine and tenaculum; removing vaginal polyps using forceps; correcting retroflexed uterus by inserting pessary; fitting diaphragm; applying sterile procedures and using gloves, speculum; explaining aftercare to patient or appropriate instructions; arranging for follow-up; recording on patient's chart.
42	Providing fertility assistance to adult female patient, through deciding to do any or all procedures involving counseling, instruction in temperature charting, prescribing medication, using needle and syringe for andrometric biopsy and analysis, arranging for analysis of husband's sperm; discussing findings with patient; recording on patient's chart.
43	Delivering a baby through the vagina, by examining patient; judging when there is true labor; ordering IV; deciding when to send patient to delivery room; deciding on pain relief and/or anesthetic, whether to rupture amnionic sac, whether to perform cesarean section. Assisting in birth with forceps, vacuum extractor and/or performing episiotomy with scissors; providing emergency care in case of cardiac arrest; clamping and cutting umbilical cord; inspecting placenta; providing aftercare; deciding when to release patient; recording and filling out any necessary papers.
44	Delivering a baby by cesarean section, by examining patient and deciding whether to go ahead with surgery; deciding on anesthetic, location of incisions; incising skin, fatty tissue, muscle wall, and uterine wall; retracting; removing infant, clamping off and cutting umbilical cord, removing placenta; closing, choosing suture materials, suturing; providing after care; deciding when to release patient; recording and filling out necessary papers.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 8 of 35

Task No.	Task Name
45	Performing an abortion by applying currettage to female with twelve weeks or less of pregnancy, by examining and deciding whether to go ahead; deciding on anesthetic; retracting vagina; applying vacuum suction; scraping remaining matter, checking patient's condition; arranging for follow-up and/or after care; recording on necessary documents.
46	Performing a saline abortion on a female with 12 to 24 weeks of pregnancy, by examining and deciding whether to go ahead; deciding on anesthetic; retracting vagina; using syringe and catheter to withdraw amnionic fluid, and syringe to inject hypertonic fluid into amniotic cavity of uterus; checking patient's condition; returning after 48 hours to check patient after she has aborted; arranging after care and follow-up; recording on necessary documents.
47	Surgically excising all or part of uterus, ovaries, ovarian ducts, cysts or growths from adult female, by examining and deciding whether to go ahead, whether to enter through abdominal wall or vagina; choosing anesthetic; incising skin, fatty tissue, muscle wall; deciding how much to remove based on examination and/or biopsy; excising as decided; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest; providing and/or arranging for after care; deciding when to release patient; recording.
48	Performing vaginal plastic surgery or surgically correcting vaginal hernia in adult female, by examining and deciding whether to go ahead; choosing anesthetic; deciding what manipulation to perform and what to remove, by incising vagina, examining tissues and/or having biopsy done; manipulating or excising tissues as decided; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest; providing and/or arranging for after care; deciding when to release patient; recording.
49	Performing ligation of fallopian tubes on adult female by examining and deciding whether to go ahead, whether to enter through abdominal wall or vagina; choosing anesthetic; incising; examining for tumors and, if found, performing biopsy; excising malignant tissue; ligating each tube in two places and cutting tubes; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest; providing and/or arranging for after care; deciding when to release patient; recording.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)

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Task No.*	Task Name
50	Taking a sample of amniotic fluid from a pregnant patient by ordering materials, having patient prepared, injecting local anesthetic, inserting needle through abdomen into uterus; drawing up fluid into syringe; examining fluid; filling test tubes; arranging to have lab tests done; and recording on patient's chart.
51	Determining the presence of monilia (candida) fungi in a slide of vaginal secretion, by adding potassium hydroxide and examining under microscope; recording findings in patient's chart and/or lab slip.
52	Contributing to Family Health Team conferences by participating in discussion on patient's problems, based on experience as Obstetrician-Gynecologist; helping to arrive at decisions on care.
53	Informally instructing nurses in appropriate patient care activities, by discussing, demonstrating and/or observing nurses' work and explaining, or when requested by nurses,or while nurses assist,using materials normally used in carrying out patient care activities. Informally assessing performance and efficiency of nurses and reporting in writing if called for by chief Obstetrician-Gynecologist (supervisor).
54	Participating in Obstetrics-Gynecology physicians' conference at Center, by participating in discussions on patient care problems, and helping to arrive at conclusions with co-workers, based on professional knowledge and experience.
55	Diagnosing any pediatric patient's development, psychological and medical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, tests and X-rays, examining physically, discussing symptoms; deciding on referrals, tests, X-rays, or care; prescribing care, treatment, medications, follow-up; delegating as decided; discussing with patient and/or adult, counseling; recording.
56	Deciding on whether to carry out a prescribed course of treatment, care or medication for any pediatric patient, and/or changing or approving renewal of prescriptions, by reviewing prescribed care, examining present condition, discussing progress and symptoms with patient and/or accompanying adult; deciding to administer medication or care or to have it done by subordinate; ordering medications, materials; and/or administering medications by insertion, as drops, as injections; observing relevant reactions; recording.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 10 of 35

Task No.*	Task Name
57	Removing a foreign object from any patient's ear, by using light, head mirror and ear speculum to locate, Zephiran solution to lure live object from ear, flushing with ear syringe or using forceps with ear speculum and mirror to remove object from ear, or arranging to send patient to hospital; recording on patient's chart.
58	Preparing any patient with foreign object in eye for care at hospital, by applying strip of sodium soluble fluorescein dye; applying eye patch; arranging to send to hospital; recording on patient's chart.
59	Removing a large, blunt metal object from any patient's pharynx, by inspecting with laryngoscope or interpreting X-rays; deciding to remove or sending to hospital; removing with use of fingers or forceps, holding tongue with tongue blade; arranging to send to hospital if necessary; recording on patient's chart.
60	Taking a sample of spinal fluid from any pediatric patient by ordering materials, having patient prepared, injecting local anesthetic, inserting needle into subarachnoid space, taking pressure with manometer and recording, drawing up fluid into syringe, examining fluid and deciding if emergency care and/or hospitalization is necessary; prescribing and administering IV infusion of food and/or medication; taking and recording fluid pressure again, arranging to have lab tests done; recording on patient's chart.
61	Drawing blood from any pediatric patient's vein by deciding where to draw from and syringe and needle size; preparing child by mummifying; locating vein; drawing blood, and filling test tubes with appropriate blood samples; providing aftercare for puncture to prevent hemorrhaging.
62	Taking a bone marrow sample from any pediatric patient by ordering materials, having patient prepared, injecting local anesthetic, inserting bone marrow needle and drawing up marrow into syringe; arranging to have lab tests done and recording on patient's chart.
63	Planning and writing lectures on prescribed subjects in patient care and medicine for Nurse Practitioners, by deciding what to present, materials to use; writing lectures, distributing to committee of pediatricians, editing; presenting lectures; participating in preparation of examinations, setting grading standards; administering tests, grading; evaluating students' ability to perform specific activities without direct supervision.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 11 of 35

Task No.*	Task Name
64	Informally providing supervision and training in patient care procedures, skills, and knowledges for Nurse Practitioners, in pediatrics, by demonstrating and/or explaining while supervising or observing; deciding when RN can perform activities without direct supervision.
65	Taking radiographs (X-rays) of any patient according to Dr.'s orders, using vertical and/or table X-ray machines, including positioning patient, adjusting controls and kilovoltage, judging quality; redoing if necessary; if "stat," identifying, jacketing and preparing for pick-up, and calling Dr.; recording in Log Book.
66	Taking IVP's (intravenous pyelogram(s)) according to Dr.'s orders, including preparing for allergy test and proceeding only on Dr.'s orders; positioning any patient; adjusting controls on table X-ray machine; watching for delayed adverse reactions of patient; judging quality and deciding to redo; if "stat," jacketing and identifying developed films for pick up and calling Dr; recording.
67	Taking lower G.I. series radiographs by taking preliminary X-ray for judging readiness for barium enema; administering enema on radiologist's orders; taking X-rays of patient with barium enema and/or air contrast X-ray, using table X-ray machine, barium enema, air syringe; positioning patient, deciding on kilovoltage, assessing quality, preparing patient and materials for radiologist; if "stat," jacketing, calling Dr.; recording in Log Book.
68	Preparing patient and barium drink for fluoroscopy; taking X-rays following fluoroscopy according to standard procedures and proper lapses of time, using table X-ray machine; positioning,deciding kilovoltage;assessing quality; if "stat," identifying,jacketing, calling Dr. who ordered;readying for radiologist; recording in Log Book.
69*	Developing radiographs and spot films by use of automatic film developing machine, including unloading cassettes, transferring identification from card to film with flasher machine, mounting 70 mm. rolls on film sheets; inserting film in developer; being sure light in room is out during entire process and until buzzer signals; giving priority to "stat" films.
70*	Preparing a tank used for hand developing of X-ray films for use by filling water compartment with water and making sure temperature is at 68°F., stirring developer and fixer solutions in their compartments and covering the compartments.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 12 of 35

Task No.*	Task Name
71*	Developing radiographs by use of hand developer, giving priority to "stat" films, including unloading cassettes, transferring identification from card to film with flasher machine; and deciding on time needed in use of tank compartments for developer, fixer, solutions, and water (at 68°F.); drying; being sure light is out during process; giving to technician, or placing for use.
72*	Loading a cassette(s) with unexposed, standard size, X-ray film(s), being sure light is out in room during process, and/or filling box for vertical X-ray machine with unexposed X-ray films; if appropriate, placing for use.
73	Reassuring any patient about X-ray and/or fluoroscopy procedures by being sympathetic, explaining safety of procedures, what will happen, and answering questions about X-ray and related procedures.
74	Explaining to any patient who has not followed proper prior procedures required for special X-ray what he must do the next time he has the appointment for the X-ray.
75*	Translating conversations between any institutional (Center) staff and any patients, from Spanish to English and from English to Spanish (if performer speaks both).
76	Obtaining information on supply needs of department by noting employee requests, own observations and taking inventory; deciding what to order; filling out requisition form and giving to designated co-worker (receptionist).
77	Monitoring the functioning of an X-ray department, including dark room, X-ray and clerical activities, and taking appropriate steps to allocate work activities so that all functions are covered.
78	Preparing a radiograph packet for interpreting by radiologist by matching requisition form to approved new radiographs, labeling envelope with identification information, placing in plastic jacket with patient's older radiographs (if ordered) and/or folder (if new patient) and placing for delivery to radiologist.
79	Preparing a barium enema by filling bag containing powder with specified amount of water, assembling tube and clamp, and placing on work table or hanging at proper height; reporting short supplies.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 13 of 35

Task No.*	Task Name
80	Assembling medications and materials to be used for test of allergy to radiopaque dye used in intravenous pyelogram (IVP) and for patient care in case of adverse reaction; reporting short supplies.
81	Assessing the quality of radiographs at the request of the coworker (X-ray technician) who took them.
82	Calling appropriate repair company and requesting repair of any equipment in X-ray department by finding out what is malfunctioning and describing to repair company personnel.
83	Identifying obvious medical condition of any non-child patient and arranging for routine care or referring patient to Dr., by taking case history, interviewing patient about symptoms, taking vital signs, looking at throat; ordering standard tests, specimens X-rays and/or medications on advice of doctor; deciding to perform or delegate some tests, specimen taking or giving medication; explaining to patient; recording on patient's chart.
84	Performing a pelvic examination on any adult female patient, by examining pelvic organs, breasts; taking and preparing cultures and/or smears from vagina; recording on Pap smear (cytology) form if appropriate; arranging for delivery to lab; if abnormalities, arranging for consultation with Dr. or ordering standard treatment for VD or vaginal infection; recording on patient's chart.
85	Providing post-partum examination and evaluating condition of any new mother by giving general examination and checking vaginal stitches, breasts, uterine fundus, asking about discharge, bleeding, health functions; providing instruction in care of stitches, breasts, how to deal with milk, breast feeding; diagnosing and prescribing care for minor problems, referring abnormalities to Dr., and arranging for treatment, care, medication; recording on patient's chart.
86	Performing a pre-natal examination on any pregnant female patient, by taking vital signs, height, weight, examining breasts, listening to fetal heartbeat, performing pelvic examination; counseling and discussing pregnancy, care, diet, hospitalization, emotional problems; taking specimens for tests; identifying condition or consulting Dr. if abnormalities found; prescribing care, treatment or medication with Dr.'s approval if appropriate; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 14 of 35

Task No.*	Task Name
87	Carrying out a prescribed course of treatment or care, or arranging for refill of medication for any patient by reviewing prescribed care, examining present condition, discussing with patient; deciding to refer problems or regulated drug renewal requests to Dr. for consultation or approval; ordering or administering medications; providing care such as for infections or wounds; assessing progress; recording on patient's chart.
88	Identifying any child patient's physical, psychological or social condition with consultation of Pediatrician, by taking case history, reviewing medical information, discussing with Dr., patient and/or accompanying adult; giving general physical examination; arranging for specimens, tests, X-rays and/or referrals to special services or Pediatrician. Deciding on treatment or care, counseling, immunization, with help of Pediatrician; and arranging for administering, or follow-up as appropriate; recording.
89	Assessing a newborn infant's medical condition for presence of abnormalities or problems,by physically examining, talking with mother, taking history; consulting with Pediatrician in cases of deformity or abnormality; treating minor problems such as umbilical stump or curcumcision wound; deciding on counseling mother on infant care; arranging for referral to Pediatrician or follow-up if appropriate; recording on patient's chart.
90	Performing a post-hospital visit with a chronic schizophrenic patient by talking with patient and checking on medication intake; evaluating whether medication should be reconsidered, whether patient should be seen by psychiatrist; providing counseling in daily living and social problems to patient and/or family; arranging for follow-up, referrals, and/or readmission to hospital; recording on patient's chart.
91*	Providing first aid in an emergency, by deciding whether to notify ambulance, Dr., poison control; deciding what first aid to provide on the spot; providing first aid; recording.
92	Deciding whether to remove thread stitches from a healed laceration and/or removing stitches on Dr.'s orders, using clamp, scissors, tweezers, antibacterial solution; referring infected wounds to Dr.; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 15 of 35

Task No.*	Task Name
93*	Testing any patient for TB by applying a prepackaged Tine test to arm, instructing patient when to return for results, entering record in patient's chart and/or informing receptionist of need for appointment to check results.
94	Assessing results of Tine test (TB) after correct lapse of time by examining patient's arm and comparing raised area to given standards to determine positive or negative results; recording on patient's chart; if positive, deciding on and ordering further tests, informing Dr., and changing or confirming decisions; recording.
95*	Testing a urine specimen obtained from any patient for items such as glucose, protein, blood, ketones, by use of tablet, urine and water in test tube, for sugar, or tablet and urine for acetone, or by use of dipstick; comparing color results with color on chart; recording results, based on chart comparison, on patient's chart.
96*	Preparing a throat specimen culture by swabbing any patient's throat, wiping on agar plate, labeling plate and having taken or taking to incubator; recording or having ID information recorded on patient's chart, incubator chart and record book.
97*	Preparing test for pinworms either by teaching parent or adult how to prepare slide by use of scotch tape wiped around child's anus or taking specimen personally in early morning; arranging for labeled slide to be taken to lab on same day; recording what was done on patient's chart.
98*	Obtaining a clean catch urine specimen from any patient by explaining clean catch procedure, giving kit, applying procedures to infant, using soap, water, swabs and self adhering urine bag; labeling, preparing for lab and recording on patient's chart.
99	Administering and recording a vision screening test of any patient except infants using Snellin eye charts; referring patients to clinic if self-scoring results indicate less than perfect vision, and calling Dr. if serious disabilities are apparent; recording.
100	Administering, recording and self-scoring the Denver Developmental Screening Test for any child, by presenting objects and words for child's responses, substituting appropriate ethnic items or words if appropriate; applying general rules for use; reporting gross abnormalities in development to Pediatrician; arranging for follow-up; recording.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
101	Providing counseling and instruction in sex matters, contraception, VD, and/or abortion for any patient of roughly adolescent or adult age, by talking about problems, using literature, visual aids, models; explaining otptions, side effects, consequences of possible decisions; deciding whether to refer to physicians, and/or co-worker; recording on patient's chart.
102	Providing any patient with special or chronic condition with counseling, reinforcement and instruction in daily living adaptations related to his condition, by reviewing diet and medication procedures, ways to adapt home, what to do in emergency; arranging for special care or services, or follow-up; giving emotional support and reporting major problems to Dr.; recording.
103	Measuring and/or re-fitting any fertile, non-pregnant female patient for a diaphragm and/or teaching patient use, care and precautions involved with diaphragm and spermacidal jelly or cream; measuring with fingers or cervimeter and trying out sizes to fit; teaching through explanation, demonstration and observation; arranging for revisits; recording.
104	Administering a common range of motion exercise to any patient on Dr.'s orders, by grasping limb and moving to natural limits in all directions; teaching patient or member of household by demonstration; reporting major changes in patient's condition to Dr.; recording on patient's chart.
105	Irrigating and/or dressing and bandaging a wound or burn as appropriate or on Dr.'s orders, using sterile water or saline solution for irrigation, antiseptic (saline solution for burn) for cleansing; leaving open or dressing as appropriate or ordered using any prescribed medication; wrapping if appropriate using sterile gauze (or vaseline gauze for burn), tape, ace bandage and/or sling; teaching patient or other person how to care for wound; recording.
106	Instructing any patient (or adult caring for child) in postural drainage technique on Dr.'s orders, by showing patient how to lie on bed to have mucus drain, and reinforcing good personal health practices; recording in patient's chart.
107	Examining and teaching an adult female patient self examination of breasts, care of minor cracks and infections and danger signs; arranging follow-up attention if warranted; recording on patient's chart.

Table A.1 . EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
108	Instructing any patient or an accompanying adult in how to perform test for sugar in urine with reagent tablet or dipstick method, and how to keep record of results, by demonstrating and explaining; recording on patient's chart.
109	Teaching a patient, family member or subordinate how to irrigate, change and care for colostomy, by demonstrating and explaining changing of bag, use of enema for irrigating, use of solvent and cement for attaching, or self adhesive bags; explaining care of skin; reinforcing proper health habits; providing psychological support; recording on patient's chart.
110	Receiving any questions (by phone) of any patient or adult caring for child about home care such as diet,medication, treatment; answering in terms of RN capabilities, referring to patient's chart; consulting Dr. for questions beyond RN capability, and relaying responses to patient by phone or recording advice given on chart.
111	Inspecting or arranging for safety inspection of any patient's home; recording safety hazards; deciding on problems and solutions; discussing with Family Health Team members if necessary; arranging for agencies or services to be contacted or provided; recording.
112	Teaching a diabetic patient and members of household how to take oral medication or inject insulin according to Dr.'s orders, by showing how to prepare syringe, swab area with alcohol, choose site of injection, check to be sure needle is not in blood vessel (having patient practice on an orange), how to care for site of injection. Explaining onset of coma or insulin shock and what to do for each; recording on patient's chart.
113*	Giving any patient general reassurance in conversation, by listening, by being sympathetic.
114	Providing pragmatic counseling on personal problems to any troubled patient, by talking with patient and helping to find solutions to problems; judging if patient is seriously disturbed; and referring to psychiatrist or Dr.; arranging for follow-up referrals if appropriate; recording.
115*	Finding out patient's problems and deciding on or reconfirming appropriate agencies for patient's needs; arranging for referral by writing letter, using agency forms or contacting by phone; complying with need for patient permission slips or Dr.'s signatures; shepherding through to the mailing of referral letter or giving to patient; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
116*	Deciding whether a patient requesting transportation to and from institution (Center) should have it, based on review of patient's chart; filling out a description of needs on request form and arranging to deliver to Transportation Dept. and delivering for approval if approved, or explaining refusal to patient.
117	Irrigating any patient's indwelling (Foley) catheter, using sterile materials and saline solution and flushing catheter, allowing returns to flow out into basin; inspecting returns; deciding to change or changing female's catheter on orders (if performer is female) by cleansing area with antiseptic soap solution, removing old catheter and inserting new one in urethra, attaching leg bag; arranging to have male catheter changed; recording on patient's chart.
118	Instructing member(s) of household of patient with indwelling (Foley) catheter in irrigation of catheter under sterile conditions and judging of quality of bladder returns, by demonstration and explanation, using sterile bulb syringe and saline or water at proper temperature; recording.
119	Instructing a new mother in preparing an infant's formula and/or bottle feeding, and/or bathing and diapering infant by demonstration and explanation, using formula ingrediants, measuring utensils, sterilizing equipment; prepared, cooled formula, container for bathing baby, water at tested temperature, vaseline, powder, diapers, pins; explaining how to hold baby for bathing and burping; recording on patient's chart.
120	Selecting, planning and presenting classes on subjects in patient care and related topics to students studying to be Family Health Workers, by deciding what should be presented, planning outline and method of presentation, assembling instructional materials, and presenting classes; being sensitive to response at time of delivery; designing examinations, deciding on grading standards; administering and grading examinations.
121	Contributing to Family Health Team conferences by suggesting patients; planning for, assembling materials for, and making presentations to; contacting patients; leading or participating in discussion on patient's problems, based on experience as Nurse Practitioner; helping to arrive at decisions on care; participating in discussion of Team functioning, based on experience as Nurse Practitioner on Team; recording.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
122	Coordinating appointments for any patient involved in multi-agency examination and evaluation (such as psychiatric, neurological and physical examinations) and follow-up referrals, by arranging and checking records of appointments and follow-up, and arranging for family member or Family Health Worker to escort if appropriate; recording.
123	Informally instructing Family Health Workers or Nursing Interns in patient care activities by demonstrating and/or explaining, using materials normally used in the course of carrying out the task being used for demonstration; deciding who, what, when and how to teach, evaluating and sometimes recording subordinates' proficiency; discussing with subordinate; deciding which tasks can be assigned to subordinates to do.
124	Informally checking on subordinates' (Family Health Workers') attendance and punctuality; deciding if there is problem and whether to discuss with subordinate and/or report to supervisor. Approving and signing or disapproving and adjusting requests for personal or vacation time off, based on need to have patients adequately covered; handling interpersonal disputes among subordinates.
125	Participating in committee work at Center dealing with health procedures and practices or institutional policy, by selecting or being invited to join committees of personal or professional nursing interest, carrying out committee work through discussion, research, writing, gathering information or views of other co-workers, helping to arrive at recommendations, and/or disseminating results to appropriate co-workers.
126	Evaluating, changing or approving a requisition form for supplies filled in by subordinate (Family Health Worker) for use in subordinate's work, by reviewing appropriateness, discussing with subordinate; signing approved form; placing for delivery.
127	Planning own work schedule and planning and/or approving a subordinate's work schedule, by deciding whether to have subordinate (Family Health Worker) plan, reviewing patients' charts and follow-up forms and deciding on order of priority for visits; planning own schedule; preparing, approving, or discussing and changing subordinate's plan; and arranging to accompany subordinate where appropriate, retaining a copy of plan.

Table A.1 . EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 20 of 35

Task No.*	Task Name
128*	Checking on non-medicinal supplies on hand and/or being informed of short supply; deciding, based on experience, what and how much to order, filling out requisition form; and delivering or having delivered to any co-worker in supply room; borrowing supplies needed if appropriate.
129*	Checking on non-narcotic (non-specially regulated) medications on hand; deciding, based on experience or special request, what and how much to order; filling out and signing institutional prescription form; delivering to any co-worker in pharmacy, or having another co-worker deliver; if appropriate, waiting for order to be filled, returning and storing in proper locations.
130	Taking institutional prescription form for non-regulated medicines and pharmaceuticals to pharmacy; or having order filled; storing filled order in appropriate locations, and arranging to borrow any out of stock which are needed at once.
131*	Planning work assignments of medical assistants to treatment rooms by obtaining lunch hour preferences and considering work loads and/or making assignments of MD's and RN's to treatment rooms and/or getting replacement for absent medical assistants -- considering need to cover facilities and personal preferences; making out assignment sheet and informing co-workers or posting in appropriate place.
132*	Checking treatment room set ups and noticing or being informed of treatment room equipment or furniture in need of repair, replacement or minor servicing; doing minor servicing, and/or requisitioning repair, and/or borrowing equipment needed at once; delivering request form to appropriate office.
133	Preparing and administering a subcutaneous or intramuscular injection for any patient according to Dr.'s orders, including preparing medication, filling syringe (from prepackaged or prepared medication), having Dr. approve, checking for allergies; advising of side effects of immunizations; choosing where to inject; disinfecting area before injecting, and recording that injection was administered on patient's chart.
134	Tallying information on specific procedures (eye tests) done and referrals of patients made (to eye clinic); recording, and delivering tally to designated department.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 21 of 35

Task No.*	Task Name
135*	Readying a treatment room for use by throwing away used materials, wiping away blood or secretion stains with anti-bacterial solution, putting clean paper on examination table and/or deciding whether to call and/or calling for housekeeping services; if appropriate, returning patients' charts to receptionist.
136*	Checking a delivered order of non-medicinal supplies, arranging for reorder of absent items; and storing delivered supplies in appropriate designated locations.
137*	Delivering prepared, labeled cultures to incubator and recording appropriate identification information and/or taking prepared, labeled slides or specimens to laboratory; giving to any designated co-worker.
138*	During course of interaction with any patient, observing symptoms or behavior, or noting concerns mentioned by patient, which should be reported to Dr. or RN to aid in patient's care or diagnosis; reporting verbally.
139*	Assessing results of Tine Test (TB) after checking that correct amount of time has elapsed, by examining patient's arm and comparing raised area to given standards (such as chart) to determine positive or negative results; recording on patient's chart, and informing Dr. if positive or if in doubt.
140*	Instructing any patient or an accompanying adult in how to perform test for sugar in urine with reagent tablet method and how to keep record of results, by demonstrating and explaining; recording on patient's chart.
141*	Testing a stool specimen for blood by use of filter paper, tablet and water, comparing color results with color on chart, and recording results of comparison on patient's chart.
142*	Administering rectal medication for any patient, according to Dr.'s orders, using finger cot, and recording on patient's chart.
143*	On Dr.'s orders, obtaining urine from any female patient, by use of female catheter under sterile conditions; using antiseptic or sterile equipment, inserting catheter, massaging patient to help void urine, and, if ordered, measuring urine, delivering for inspection or preparing for laboratory analysis and/or recording amount obtained and abnormal appearance on patient's chart.

Table A.1 . EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
144	Preparing a hot water sterilizer for use by filling with water and/or emptying water; and disconnecting at end of day.
145*	Preparing soiled equipment for sterilization in autoclave by washing with soap and water, drying, inspecting for damage or missing parts, wrapping in autoclave paper and taping.
146*	Setting autoclave for sterilizing equipment and inserting wrapped packets for sterilizing.
147*	Preparing a patient for a pelvic examination and preparing materials, based on Dr.'s orders, including instruments and materials for slides; taking wet prep slides to lab; preparing other slides for lab, including use of fixative, and labeling; taking or having slides taken to lab.
148	Receiving any patient's questions (by phone) about home care such as diet, medication, treatment, answering in terms of LPN capabilities, referring to patient's chart; consulting Dr. for questions beyond LPN capability, and relaying responses to patient by phone.
149*	Preparing treatment or equipment materials for use by sterilizing in hot water sterilizer for appropriate amount of time, removing, and wrapping in sterile barrier.
150*	Checking supplies of medications and vaccines on hand and/or in MD emergency bag for expired dates; assembling those expired for return to pharmacy.
151*	Preparing treatment rooms for use by dusting surfaces with alcohol-soaked cloth, checking, replenishing and arranging examination and treatment supplies, linens, sterile equipment for use as needed; replacing supplies and equipment at end of day and making sure all equipment is turned off.
152*	On Dr.'s orders inoculating any patient with smallpox vaccine using prepackaged vaccine and monovacc needle; explaining aftercare to patient and recording on patient's chart.
153*	Assisting any Dr. or RN by handing examination or treatment supplies, materials or equipment as ordered and/or turning equipment on, off or adjusting as required, or on orders.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 23 of 35

Task No.*	Task Name
154	Contributing opinions, judgments, information and feelings about care and treatment of patients being discussed; participating in discussions of functioning of Unit, based on experience as LPN in Unit.
155*	Obtaining a specimen of urine, by explaining to patient how to provide and/or preparing specimen for lab by covering, labeling with identification information and arranging for delivery to lab with requisition slip.
156*	Removing old dressing and/or irrigating and/or cleaning and dressing a wound or burn according to Dr.'s orders, using sterile procedures, using saline solution or sterile water for irrigation; antiseptic for cleansing (or saline solution if burn); leaving open or dressing as ordered; using prescribed medication; wrapping as tightly as ordered, using sterile gauze (vaseline gauze if burn), and tape or ace bandage or sling; explaining care to patient; recording condition of wound and/or care given in patient's chart.
157*	Checking a patient's chart for entry of results of lab tests; obtaining or accounting for missing information by checking with lab or medical records.
158	Informally assessing the work of subordinates (medical assistants), by deciding to observe performance, deciding whether to give informal training through demonstration of procedures or explanations, or both, and informally reporting on subordinates' performance when asked.
159	At Dr.'s request, arranging for a new appointment after a patient has broken an appointment with Dr., by calling patient and/or discussing reasons for visit with Dr. and then patient, or arranging to have a Family Health Worker see patient to assess problems and arrange visit; recording.
160*	Escorting any patient and accompanying adult with child from one area of institution (Center) to another, delivering patient's chart and other forms and introducing patient to designated coworker in new area.
161*	Weighing and measuring any patient, using balance scale and ruler for adults and infant scale for infants; and recording on patient's chart and/or on anthropometric chart for children.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.	Task Name
162*	Irrigating any patient's ear with warm water or peroxide using an ear syringe according to Dr.'s orders; reporting returns if requested.
163	Preparing materials for special procedures to be done by Dr. such as bone marrow puncture, spinal tap, amniocentesis, suturing; checking with Dr. on completeness; making sure materials are sterile for use and/or that kits are not expired.
164*	Filling out anticipated forms needed in a patient's visit with identification information called for; giving to co-workers who will use them.
165	Deciding whether a subordinate has been excessively late and/or absent or abusive of lunch hours; if so, deciding whether to report this to supervisor; if so, making report orally at that time, or when asked.
166	Assembling suture materials for Dr. about to suture lacerations of any patient, assembling kind of suture material, needle and medication as asked for by Dr.
167	Preparing and administering an intramuscular or subcutaneous injection to any patient according to Dr.'s order, including getting medication from pharmacy or supplies on hand, preparing medication, filling syringe (from prepackaged or prepared medication), choosing where to inject, disinfecting area before and after injecting, and recording and signing patient's chart to indicate injection was administered.
168	Determining which throat cultures have been in incubator long enough, based on wall chart showing times and dates entered, and taking cultures which are ready to MD on duty for interpreting.
169	Collecting Dr.'s written assessment of throat culture slides; recording results in record book; arranging to have appointment made for patient if positive results.
170	Assisting any patient in dressing and/or undressing.
171	Upon being asked, giving opinion on whether any patient waiting in emergency room is in need of immediate attention of Dr., by talking with patient, looking at condition and checking chart, if available. If emergency, escorting patient in at once and notifying MD on duty.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
172	On Dr.'s orders, taking a fresh stool specimen from any adult patient by using finger cot and inserting finger into rectum; testing stool specimen for blood by using paper, tablet and water; comparing color results with color on chart; showing reults to MD.
173	Preparing a patient for suturing under Dr.'s orders and supervision by cleaning area with antibacterial agent, shaving hairy area using razor and antibacterial lathering agent; standing by during suturing; clipping suture material with scissors after Dr. is done.
174	Washing used specula or other equipment with soap and water, dipping in alkaline solution, and placing in sterilizer.
175	Preparing treatment sets or other equipment for sterilization by collecting parts, wrapping in gauze and brown autoclave paper, taping packet, placing in autoclave and setting timer.
176	Removing sterilized packets of equipment from autoclave and storing in appropriate, designated locations.
177	Treating any patient for ringworm according to Dr.'s orders by cleaning area with antibacterial agent, shaving hairy area and applying prescribed ointment.
178	Preparing sterilized treatment equipment for use by removing from sterilizer, wrapping in sterile barrier paper and storing in appropriate locations.
179	Preparing an intravenous bottle for use by Dr. according to orders by filling bottle with prescribed medication, labeling bottle with medication, if prescribed, and time; attaching to IV pole, placing near patient and Dr.; placing sterile needles on tray near Dr.
180	Preparing a tray with materials to be used by Dr. in drawing blood for a lab work-up; labeling test tubes as samples are filled, and informing patient or accompanying adult of where to take samples and disposition sheet (to lab).
181	Preparing a tray with equipment to be used by Dr. for nasal packing and for examination, and placing, at Dr.'s orders, near Dr. and patient.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 26 of 35

Task No.*	Task Name
182	Preparing patient for gastric lavage and/or bringing and setting up suction machine for use by Dr. by rolling in, cleaning and attaching disposable catheter; turning machine on and off at Dr.'s orders; cleaning up afterwards and taking sample of material from container for Dr.'s inspection, if called for.
183	Inducing vomiting in any patient on Dr.'s orders by administering a vomit-inducing liquid; cleaning up afterwards.
184	Locking (if night shift) or unlocking (if day shift) closet(s) or refrigerator where special equipment or medications are stored.
185	Assisting in administration of oxygen to any patient by wheeling in oxygen tank, placing mask on patient, turning on machine and adjusting oxygen flow under Dr.'s supervision, according to Dr.'s orders.
186	Explaining the layout, storage locations, and work procedures of the work area (Emergency Room) to a new (somewhat subordinate) coworker (medical assistant).
187	Administering medication taken orally to any patient by filling Dr.'s orders from available supplies, or pharmacy (using Dr.'s prescription); serving liquid in calibrated cup; recording or signing patient's chart to indicate that medicine was administered.
188	On Dr.'s orders, administering a cold bath or cold towels to any patient in order to reduce fever, using ice cubes and cold water in tub for child; cold towels for adults; periodically, checking and reporting patient's temperature to Dr.
189	On Dr.'s orders, treating any patient for lice by shampooing with medicated shampoo and warm water, and sometimes shaving head with razor and blade.
190*	Assisting any disabled patient in moving to and from objects such as wheelchair, bed, toilet by using arms and hands to provide support and/or transporting in wheelchair to designated locations if appropriate.
191	Applying a splint to any patient according to Dr.'s orders, bending to prescribed angle, using gauze and tape, ace bandage, board and/or sling, as required.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
192	Assisting in a cardiac or other emergency by bringing in emergency cart, preparing patient on Dr.'s orders for EKG, applying leads, and/or on Dr.'s orders preparing injections, IV bottle, or helping as ordered; afterwards having emergency cart re-equipped and returning cart.
193	Preparing any patient and materials for a bone marrow puncture or spinal tap, on Dr.'s orders, by laying out appropriate prepacked kit, cleansing appropriate body part with antiseptic, draping patient with sheet if appropriate, and informing Dr. when patient is ready.
194	Administering medication in the form of eye or ear deops to any patient, according to Dr.'s orders, and signing patient's chart to indicate that medication was administered.
195	Applying an eye patch for any patient on Dr.'s orders.
196	On Dr.'s orders giving any patient a prepared fleet enema kit and instructing patient in its home use.
197	Going over with any patient and reinforcing Dr.'s orders on diet, prohibited food, procedures for taking medication, home care, or return visit.
198	Administering medication taken orally to any patient by filling Dr.'s orders from available supplies, having Dr. approve, serving liquid in calibrated cup, and recording on patient's chart. Explaining side effects, if appropriate.
199*	Preparing any patient for examination by having (or assisting in) clothes removed; taking and recording vital signs (temp., blood pressure; pulse; respiration); informing Dr. patient is ready.
200*	Applying hot and/or cold compresses or other materials as prescribed by Dr. to indicated parts of any patient's body for prescribed periods of time or until desired effect is obtained, taking precautions not to burn skin; recording treatment and results on patient's chart.
201*	On Dr.'s or RN's orders, administering a cold water or alcohol rub to any patient in order to reduce fever; using towels or sheet; periodically checking temperature; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 28 of 35

Task No.*	Task Name
202	On RN's or Dr.'s orders, providing introductory information on contraception techniques by showing devices and explaining to any patient how each is used, effectiveness, advantages and disadvantages and answering questions.
203*	Explaining the nature and purpose of a special diet to any patient or encouraging patient to continue to follow it and/or helping to come up with substitutes in the ethnic foods of the patient that are compatible with diet; recording on patient's chart.
204*	Informing (orienting) new employees, new patients, and any accompanying adults, about the facilities of the institution (Center) through descriptive explanation and/or a tour, covering procedures, functions and arrangement of the place, introducing employees when deemed appropriate.
205	Giving any patient an enema according to Dr.'s orders, observing amount and color of expelled material, and recording on patient's chart.
206	Examining any bedridden or immobilized patient for presence of bed sores and if found giving decubital care using lotion on skin and Phisohex on open sores; recording check and treatment on patient's chart.
207	Deciding whether to test and/or testing plaster in patient's home for lead, by using prepared solution; making appointment for examination for children if results are positive and notifying Poison Control, and filling out form on lead poisoning for patient's chart.
208	Asking any patient for a stool specimen, explaining how it is taken, collecting the specimen, labeling it, and bringing it to the lab.
209	Taking the temperature of any patient and, if there is fever, administering an alcohol bath, notifying Dr. if patient is an infant or fever does not go down; recording on patient's chart.
210	Bathing any adult, bedridden patient with soap and water or Phisohex, drying, applying powder and/or lotion; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
211	Instructing a new mother in how to bathe and diaper a new infant, by demonstrating and explaining; recording on patient's chart.
212	Assisting any patient except infants to bathe in tub or shower; recording on patient's chart.
213	Treating a baby for cradle cap according to Dr.'s orders by washing with oil, possibly brushing, and washing with water; recording on patient's chart.
214	Treating a patient with itching scalp by giving shampoo according to Dr.'s orders; recording on patient's chart.
215	Instructing a new mother in how to prepare an infant's formula, either in a standard manner or according to Dr.'s orders, by demonstrating and explaining including boiling of formula, sterilizing of bottles, capping of bottles, setting out of filled bottles to cool; recording on patient's chart.
216	Instructing a new mother who will bottle feed an infant on how to bottle feed and burp the infant by explaining and demonstrating; recording on patient's chart.
217	Deciding whether to prepare food for and/or feed any patient except an infant; preparing and/or feeding patient; recording on patient's chart.
218*	Irrigating and/or cleaning and/or dressing a minor wound or minor burn according to Dr.'s orders; or deciding whether to change bandage using saline solution or sterile water for irrigating, antiseptic for cleansing (saline solution if burn); leaving open or dressing as ordered, using prescribed medication; wrapping as tightly as ordered, using sterile gauze (vaseline gauze if burn), and tape or ace bandage or sling; explaining care to patient; recording on patient's chart.
219	Finding out about the circumstances of any patient's appointment to go to any social agency, accompanying the patient so as to provide help, clarification and moral support; recording on patient's chart.
220	Answering a phone; calling the correct person or, if appropriate, writing message on pad and placing on correct desk.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 30 of 35

Task No.*	Task Name
221	Giving an oral presentation about the institution (Center) and about good general health practices to group of community people such as school children, by speaking, sometimes using visual aids and/or distributing literature.
222	Duplicating record forms (such as patient's medical records, in desired quantities on duplicating machine (such as Xerox).
223	Deciding whether to make unoccupied bed; making bed by stripping of soiled linen, making up bed with clean linen obtained, disposing of soiled linen in appropriate place; recording on patient's chart.
224	Deciding whether to make bed containing a bed ridden patient; making occupied bed by obtaining clean linen, stripping bed and making bed by rolling patient; disposing of soiled linen in appropriate place; recording on patient's chart.
225	Checking family's or patient's drugs and medications for old or left-over medication; and explaining to family the need to throw out old medications or those left over after a course of treatment is over; recording on patient's chart.
226	Deciding on giving or reinforcing basic sex information, contraception information or making patient aware of availability of abortion information by explaining or giving literature on basic sex information, reinforcing contraceptive information or referring to RN, or referring patient to RN for abortion information; recording on patient's chart.
227[a]	Preparing bag for home visit based on plans for day.
228	Teaching a TB patient and/or members of his household proper daily health practices; recording on patient's chart.
229	Changing any patient's colostomy bag on Dr.'s orders; irrigating tube and cleansing patient; recording on patient's chart.
230	Preparing materials for use in a catheter irrigation.

[a] This task was created as a "dummy" task when it was discovered that the number 227 was not used in assigning code numbers to tasks. It is actually a preparatory element for most performers.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
231*	Delivering forms or supplies and/or picking up and returning with forms or supplies, conversing with co-workers if appropriate.
232	Helping any patient requiring assistance in walking by providing support with arms or hands, if without support devices, or reinforcing instructions already given on use of walker, cane, or crutches.
233	Irrigating the eye of any non-infant patient with a foreign body in eye or irritation by using an eye cup and water or cotton balls and water and/or instructing the patient in how to do this for himself; recording on patient's chart.
234	Delivering medication to any adult patient or any person in charge of an infant or child patient and explaining how to take, how much and when, based on instructions on the medication; recording on patient's chart.
235*	Checking on current stock of supplies and forms and deciding what to request,based on experience on what should be on hand and usage; requesting supplies from supervisor or filling out request for supervisor's approval.
236	Deciding whether and when to discuss personal, social, or health problems with patient and/or members of family or household; discussing and providing information on agencies or other forms of help available; recording on patient's chart.
237	Deciding whether to discuss consumer problems with patient; advising patient and/or family or household on consumer protection and/or rights by using literature and information; advising on how to stretch money using information on good practice and available aids, and/or helping to design a family budget; recording on patient's chart.
238	Deciding whether any patient needs homemaking services, sometimes consulting with the nurse involved; deciding what homemaking services to provide, such as shopping, cooking, serving, feeding, cleaning, bathing; providing the service, using materials found in the home; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
p. 32 of 35

Task No.*	Task Name
239	Helping to select a family for a Family Health Team conference; explaining purpose and inviting family; preparing materials, notes and information; presenting the family's problems and background at the conference; participating in discussion of problems and helping to arrive at recommendations based on experience as Family Health Worker; recording recommendations reached.
240	Arranging for appointment for any patient at Center based on review of patient's chart or call from patient; notifying patient by mail or phone, or following up on broken appointment.
241	Showing job procedures and practices and providing job orientation to a new co-worker in the performer's own job title (Family Health Worker) sometimes under the supervision of a Nurse Practitioner.
242	Contributing to discussions and writing up forms in order to make the performer's job description more accurate in its reflection of the work done.
243	Taking vital signs (temperature, blood pressure, pulse rate, respiration rate) and recording on patient's chart; deciding if any are abnormal; if so, notifying Dr.
244	Teaching any member of household how to take a temperature by demonstration and explanation using oral and/or rectal thermometer, sometimes demonstrating on child, including how to care for and clean thermometer; recording on patient's chart.
245	On a newly assigned family's first visit explaining the Center, purpose of visit and role of performer (Family Health Worker; obtaining information needed to fill out Census form, medical and social background information form, and home evaluation form on home safety by oral questions and observation; recording on record of home visit form.
246	Reviewing intake information on family; discussing with Dr. and/or nurse to determine what diagnostic tests are needed; ordering tests by filling out lab slips and arranging for any other special procedures; deciding on order of importance of family problems; recording with suggestions on Problem List; deciding whether home visit or Center appointment is needed; recording or making appointment.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
247	Finding out that any patient and family has moved from the Family Health Team's area; consulting with Dr. and filling out the proper request, either that patient should be retained for follow up care, or that family should be assigned to proper team and the reason; arranging for delivery of request form.
248	Conducting a routine prenatal examination of a pregnant patient under supervision by making health checks, discussing physical and emotional health, providing information and instruction on health practices, childbirth, available services, abortion; recording observations, informing Dr. or nurse of abnormal conditions; making appointment for visit if so decided.
249	Conducting a routine post partum examination of a new mother by checking vaginal stitches, breasts, vital signs, uterine fondus, asking about discharge, bleeding, health functions; providing instruction in care of stitches, breasts, how to deal with milk, breast feeding; recording observations, informing Dr. or nurse of abnormal conditions; making appointment for visit if so decided.
250	Conducting a routine neonate (newborn) examination by general inspection of spontaneous movement of extremities, parts of the body, reflexes, caring for umbilical stump; collecting information on feeding, stool, sleep; reinforcing mother in proper infant care; recording observations; informing Dr. or nurse of abnormal conditions; making appointment for visit if so decided.
251	Conducting a routine examination of any patient who is 6 months or over by taking vital signs, listening to chest, examining eyes, nose and throat; recording on patient's chart; informing Dr. or nurse of abnormal conditions; making appointment for visit if needed.
252	Conducting an examination and/or providing follow up care and/or reinforcement for any patient with a chronic disease by reinforcing Dr.'s orders on care, diet, medication; explaining tests to be taken; taking vital signs and providing special care as appropriate; recording on patient's chart; informing Dr. or nurse of change in condition; making appointment for visit if needed.
253	Following up on a patient discharged from a hospital by checking on his intake of medication, appointments for care, deciding whether transportation is needed and providing for transportation; notifying Dr. of any special problem; recording on patient's chart.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
254	Planning and writing out a weekly work schedule using information on the patients to be provided services by the performer, and coordinating with supervisor (Nurse Practitioner); leaving one copy for supervisor and retaining the other.
255	Contributing opinions, judgments, information and feelings about care and treatment of patients being discussed, based on experience as Medical Assistant; and participating in discussions of functioning of performer's Unit based on experience as Medical Assistant in Unit.
256	Administering prepacked liquid polio vaccine orally to any patient on Dr.'s orders from available supplies, serving liquid to adult, pouring for child, dropping with dropper into infant's mouth; recording on patient's chart.
257	Administering and recording a vision screening test to any patient, using Keystone vision testing machine or Snellin eye charts; referring patients to clinic if self-scoring results indicate less than perfect vision, and calling Dr. if serious disabilities are apparent.
258	Checking that any female patient who has had a contraceptive device prescribed understands how to use it and the possible side effects, by questioning patient and/or reinforcing, based on prepared instruction sheet.
259	At request of RN or MD, taking a partial social, family and/or medical history from any patient; asking only routine, predetermined questions, and recording by checking off or writing responses on forms or paper; giving to Dr. or RN.
260	Preparing a hypodermic needle for injection according to Dr.'s or RN's orders including preparing medication, filling syringe if not prepacked, aspirating and capping needle tip with sterile cap, placing for use and having Dr. or RN check medication and dosage.
261	Answering phone in Unit and notifying person being called or relaying message; calling Dr. if emergency; or making appointment for Dr. or RN; recording in appointment book, and on appointment slip for mailing.

Table A.1. EXTENDED TASK NAMES BY CODE NUMBER (continued)
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Task No.*	Task Name
262	Taking an electrocardiogram of any patient by preparing patient, giving appropriate exercises or using special equipment or leads if requested by Dr.;applying medium, taking readings using appropriate leads, calling a physician in an emergency; tearing off EKG strip, writing name of patient on it, clipping to patient's request form.
263	Cutting and mounting an EKG strip on a self-adhesive EKG chart; filling in patient information on front of chart and putting chart in designated place for delivery.
264	Ordering duplicate copies of forms (such as mounted EKG chart), by filling in order, clipping to material to be copied, and placing in pick up location.
265	Filing or pulling from files patient's records or data filed by patient's ID number or name.
266	Placing and arranging nondrug supplies (such as electrode pads, cotton balls) on labeled shelves in cabinet.
267*	Routinely cleaning or dusting the body of special machines (such as X-ray or EKG) and removable parts with cloth soaked in alcohol, domestic cleanser or with sponge and water.
268	Checking EKG machine for its supply of cardiograph paper and replacing roll when needed.
269*	Judging that special equipment such as X-ray film developing machine or EKG machine is out of order or needs repair; inspecting in order to describe problem and notifying supervisor or repair service as appropriate.
270	Demonstrating and explaining how an EKG is taken, selecting the amount of detail to fit the audience which can include school children,other visitors or Center (non EKG) personnel.
271	Deciding if an EKG reading looks abnormal and notifying appropriate Dr. if it looks "suspicious" or abnormal.
272	Checking level of developer and fixer solutions in designated barrels in automatic X-ray film developing machine, and refilling with developer and fixer solutions from bottles containing prepared solutions.
273	Turning on automatic equipment such as X-ray film developing machine for use by moving on-off switch to on position.

* Tasks with asterisk appear for more than one of the 12 titles studied.

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED.
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Code No.	Scale Name and Description	Total Tasks[a]
1	LOCOMOTION The skill refers to the degree of body coordination required of a performer in the task being scaled. The skill involves the movement of the performer's body, torso or limbs through space in order to achieve predetermined standards of body movement or position. The level of the skill rises with the degree of body coordination required. This is determined by the complexity of the standards involved, or the complexity of external conditions which restrict motion. The scale level is not determined by requirements for strength or the level of knowledge which may be involved.	3
2	OBJECT MANIPULATION The skill refers to the degree of control required of a performer in directly manipulating objects in the task being scaled. The skill involves the direct handling of objects using fingers, hands, or limbs to achieve a predetermined standard. The level of the skill rises with the degree of precision required and with the fineness of the manipulation involved. When fingers, hands or limbs manipulate an object in order to manipulate another object, the skill level reflects the direct manipulation involving the fingers, hands or limbs. The scale level is not determined by the level of knowledge needed to manipulate objects.	197
3	GUIDING OR STEERING The skill refers to the degree of precision required of a performer in the task being scaled in moving an object over a predetermined pathway or holding steady on a moving target. The skill involves coordinating the performer's perceptions of external stimuli, which tell him his position, with his control of the object, in relation to the desired position or movement. The predetermined pathway or moving target may be actual or visualized. The level of the skill rises as the precision rises (or relative margin of error declines), and as the complexity of stimuli or the number of spatial directions or movements involved increase. The scale level is not determined by the degree of arm-hand steadiness involved, nor by the Figural Skills involved, nor by the level of knowledge required to accomplish the guiding or steering.	6

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[a] "Total Tasks" column refers to the number of tasks of the entire 273 that were rated above zero on each of the 16 Skill Scales. The 17th scale, the Knowledge Scale, was used for each knowledge category.

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)

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Code No.	Scale Name and Description	Total Tasks[a]
4	*HUMAN INTERACTION* The skill refers to the degree of sensitivity to others required of the performer in the task being scaled. The skill involves the performer's perception of the relevant characteristics or state of being of the other person(s), the performer's attention to feedback as the interaction occurs, and the performer's appropriate modification of his behavior so as to accomplish the task. The skill is involved if the task requires any personal contact or interaction with others. The scale value of this skill rises as the degree of perceptiveness and sensitivity required of the performer rises, and as the subtlety of the feedback to which he must respond increases.	242
5	*LEADERSHIP* The skill refers to the degree to which leadership in interacting with subordinates is required on the part of the performer in the task being scaled. The skill is involved when the performer's task requires him to interact with subordinates so as to affect their work performance in order for the performer to achieve goals related to the task. The subordinate relationship may be *de facto* as well as formal. The scale value of this skill rises in relation to three aspects of the performer's relationship with subordinates, relevant to the task situation. These are: (1) power over subordinates' conditions of employment; (2) clearness of channels of communication; and (3) clearness of subordinates' own relevant task procedures. *Low levels of Leadership* are required when the performer has a great deal of power over the subordinates' conditions of employment, when the performer has very formal and clearly defined channels of communication with the subordinates relevant to the task situation, and when the tasks of the subordinates related to the performer's objectives are very clear cut, obvious, and require little discretionary judgment. *High levels of Leadership* are required when the performer's power is low, when channels of communication are vague and undefined, and when the relevant subordinates' tasks are vague and require a great deal of discretionary judgment.	81

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)

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Code No.	Scale Name and Description	Total Tasks[a]
	The level of Leadership required for the task being scaled is determined by a combination of ratings of high, medium or low on the Leadership requirements determined by each of the three aspects.	
6	ORAL USE OF A RELEVANT LANGUAGE The skill refers to the level of precision in comprehension of heard language required of the performer in the task being scaled and to the level of precision required in conveying meaning orally in the task situation. (The language referred to is the one in common use for the task.) The level of this skill rises as the degree of precision in oral use of the language required in the task rises. The level of the scale is not determined by the knowledge reflected in the language used, nor by the skill of vocal delivery involved.	242
7	READING USE OF A RELEVANT LANGUAGE The skill refers to the level of comprehension required of the performer in his reading of written or printed material in the task being scaled. (The language referred to is the one in common use for the task.) The level of this skill rises as the degree of precision in the reading use of the language required in the task rises. The level of this scale is not determined by the knowledge reflected in the material which is read.	239
8	WRITTEN USE OF A RELEVANT LANGUAGE The skill refers to the level of precision required of the performer in conveying meaning in the task being scaled through the written use of language. (The language referred to is the one in common use for the task.) The level of this skill rises as the degree of precision in the written use of the language required in the task rises. The level of this scale is not determined by the knowledge reflected in the language used, nor by the level of knowledge of grammar or of literary form involved.	195

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)

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Code No.	Scale Name and Description	Total Tasks[a]
9	DECISION MAKING ON METHODS The skill refers to the degree of responsibility required of a performer with respect to decisions he must make about how he does the task being scaled. How the task is done (the method) includes what is done, when, in what order, what to use, and whom to involve. When the performer has any amount of latitude in deciding how to do a task, the skill is involved. The skill rises as the choice of methods in the task situation are less and less obvious or specified; the skill rises as the circumstances of the task from one instance to another are more and more varied. The level of this scale is not determined by the level of knowledge required to perform the task.	261
10	DECISION MAKING ON QUALITY The skill refers to the degree of responsibility required of the performer with respect to decisions he must make about the quality of the output he produces in the task being scaled. The scale is applied assuming acceptable levels of performance. The skill is involved when the performer has any effect on the quality of the task's output. The skill rises with the extent to which the performer can affect the output's quality. It is also affected by whether or not the output is subject to review or inspection by others before it is used. The level of this scale is not determined by the level of knowledge required to do the task.	265
11	FIGURAL SKILLS The skill refers to the level of complexity required of the performer in the task being scaled in dealing with figural aspects of materials. The skill involves the mental manipulation of figural properties in order to achieve a predetermined figural standard or objective. The figural aspects involved are limited to size, shape, form, or arrangement of materials in relation to space, whether the mental images involved or the materials dealt with are static or in motion. A figural standard would involve norms or criteria for size, shape, form or their arrangements in space. The skill rises as the complexity of the figural standards which must be achieved to perform the task rise, and as the complexity of the figural relationships whose aspects the performer must deal with rise.	122

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)

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Code No.	Scale Name and Description	Total Tasks[a]
12	SYMBOLIC SKILLS The skill is called for when the performer is required by the task being scaled to manipulate or use abstract symbols which are part of a system of symbolic notation. The skill involves the use of or manipulation of symbolic properties in such systems as numerical, musical, or code notations. The skill does not involve the semantic meaning or the figural properties of the symbols, or use of single, one-to-one symbols which are not part of a system of notation, or use of representational symbols. The skill rises with the degree of complexity of the manipulation or use made of the symbols and with the complexity of the symbolic properties of the symbols. The level of this scale is not determined by the level of knowledge or subject matter represented in the symbols, or by the figural properties of the symbols involved.	64
13	TAXONOMIC SKILLS The skill is called for when the performer is required by the task being scaled to consciously apply or create conceptual classifying or organizing principles. The skill involves the application of mental processes to assign an unknown set of information to existing conceptual classes or systems, or the creation of conceptual classes or systems to suit the needs of the task. The skill does not involve the use of intuitive judgment, the use of simply figural or symbolic principles, or the one-to-one matching of obvious characteristics. When conceptual organizing or classifying principles are to be applied, the skill rises with the level of complexity of the principles. When conceptual organizing or classifying principles are to be created, the skill rises with the level of complexity of the purposes they must serve in the task.	72

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)
p. 6 of 7

Code No.	Scale Name and Description	Total Tasks[a]
14	IMPLICATIVE SKILLS The skill is called for when a performer must come to conclusions or draw implications in the task being scaled which go beyond the memorization of cause-and-effect relationships or simple associations. The skill involves the application of mental processes to deal with a set of information, so as to draw non-routine conclusions or inferences, or to foresee consequences in the performance of the task. The skill rises with the degree of complexity of the information with which the performer must deal in drawing implications, and rises with the extent to which the kinds of information from which the conclusions or inferences are to be drawn vary from one instance of the task to another. The level of this scale is not determined by the seriousness of the errors in judgment which could be involved.	165
15	FINANCIAL CONSEQUENCES OF ERROR The skill refers to the degree of responsibility carried by a performer with respect to the financial damage which could result from errors in his performance of the task being scaled. The error whose consequences would be rated would be the most serious likely error to be expected from a performer qualified to do the task. The skill is involved if errors in performance of the task have any financial consequences involving the output, equipment, materials, time or other chargeable items. The level of this scale is not determined by the value of insurance claims or damage suits which would result from harm to humans.	215
16	CONSEQUENCES OF ERROR TO HUMANS The skill refers to the degree of responsibility carried by the performer with respect to the harm which could be done to humans as a result of errors in his performance of the task being scaled. The error whose consequences are rated would be the most serious likely error to be expected from a performer qualified to do the task. The skill is involved if errors in performance of the task result in any physical or mental harm to humans, including recipients, respondents, co-workers, or persons not directly related to the task. The performer is included. The level of this scale is not determined by any financial harm which could be done to persons.	267

Table A.2. DESCRIPTIONS OF SCALES ON WHICH PILOT TEST TASKS WERE RATED. (continued)

p. 7 of 7

Code No.	Scale Name and Description	Total Tasks[a]
a	LEVELS OF KNOWLEDGE The scale refers to the level of knowledge in a given subject category required of the performer in the task being scaled. The knowledge categories which are required for each task are identified, and each category is rated with this scale. To be rated above zero on the scale the task must require knowledge beyond the simple memorization of the overt steps of the task. The scale rises with the amount of detailed knowledge which must be consciously applied and with the depth of understanding required in the subject area, in terms of its content, the structure of its ideas and its uses. "Detailed knowledge" covers such things as technical or special terms or facts. "Consciously applied" means that the performer is able to (but need not) articulate his use of the knowledge in the task situation.	

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[a] "Total Tasks" column refers to the number of tasks of the entire 273 that were rated above zero on each of the 16 Skill Scales. The 17th scale, the Knowledge Scale, was used for each knowledge category.

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a]
p. 1 of 16

Code No.	Category Name	Total Tasks
11200000	Genetics (For molecular and microbial genetics see Molecular biology.)	15
11731000	Normal structure and function (The categories listed below include both anatomy and physiology except where otherwise specified.)	89
11731100	Regional anatomy (Includes head and neck, thorax (back) and abdomen, pelvis and perineum, lower and upper limbs, and skeleton.)	104
11731200	Topographic anatomy (relation of external manifestations to internal structure and function, e.g. location of pressure points, surface appearance of joints, muscles and bones.)	78
11731300	Hematopoietic system (Includes blood, red and white blood cells, platelets, and bone marrow, liver and spleen in their blood forming function.)	25
11731400	Circulatory system (cardiovascular system) (Includes heart, veins, arteries, lymphatics.)	63
11731500	Respiratory system	57
11731600	Digestive system	44
11731610	Mouth, pharynx (digestive function), and esophagus (Includes tongue, teeth, and salivary glands.)	24
11731620	Stomach and small intestine (Includes duodenum, jejunum, ileum.)	23
11731630	Large intestine (colon) and rectum (Includes appendix, anus, and mesentery.)	25
11731640	Liver, biliary system, and pancreas (Includes gall bladder, cystic duct, bile duct, pancreatic duct, ampulla of Vater.)	21

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[a] Presented by order of appearance in HSMS Knowledge Classification System. The "Total Tasks" column refers to the number of the entire 273 tasks which require the category at some level on the HSMS Knowledge Scale.

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
11731700	Urinary system (Includes kidney, ureter, bladder, urethra, external genitalia.)	54
11731810	Muscles	40
11731820	Bones and joints (Includes ligaments and tendons)	40
11731831	Skin and sweat glands	48
11731832	Hair	11
11731833	Nails	12
11731900	Nervous system	44
11731910	Central nervous system (brain and spinal cord)	23
11731920	Peripheral nervous system	23
11731930	Autonomic nervous system (Includes sympathetic and parasympathetic nerves.)	24
11731941	Olfactory nerve and receptors	11
11731942	Taste buds	5
11731943	Eye and optic nerve	30
11731944	Touch, heat, cold and pain receptors	6
11731945	The ear (Note that this category excludes balance function.)	29
11731946	Kinesthetic receptors (Includes semicircular canals.)	9
11732100	Immunologic system (Includes immunological mechanisms, humoral and cellular factors.)	29
11732210	Endocrine glands and their hormone physiology (Includes pituitary, adrenal, thyroid, parathyroid, pineal, and pancreas, ovary and testes in their endocrine functions.)	35

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
p. 3 of 16

Code No.	Category Name	Total Tasks
11732220	Reproduction	42
11732221	Conception and contraception	30
11732222	Male reproductive system	31
11732223	Female reproductive system (Includes the body changes associated with ovulation, conception and pregnancy, e.g. development of placenta.) (For development of the embryo see Growth and development.)	50
11732300	Homeostasis of fluids (Includes fluid and electrolyte balance.)	28
11732400	Metabolism	30
11733000	Pathology (abnormal function and structure) (Includes the etiologic and diagnostic aspects of disease.) (See also First aid for emergency treatment and care.)	99
11733100	Infective and parasitic diseases	63
11733200	Neoplasms (cancerous growths)	42
11733300	Endocrine, nutritional, and metabolic disorders	43
11733400	Disorders of blood and blood-forming organs	26
11733510	Disorders of the central nervous system	37
11733520	Disorders of the peripheral nervous system	33
11733530	Disorders of the autonomic nervous system	32
11733541	Disorders of the olfactory nerve and receptors	8
11733542	Disorders of the taste buds	5
11733543	Disorders of the eye and optic nerve	24
11733544	Disorders of touch, heat, cold and pain receptors	6
11733545	Disorders of the ear	20

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)

p. 4 of 16

Code No.	Category Name	Total Tasks
11733546	Disorders of kinesthetic receptors	6
11733600	Disorders of the circulatory system	52
11733700	Disorders of the digestive system	42
11733800	Disorders of the respiratory system	49
11733900	Disorders of the uro-genital system	54
11734100	Disorders of the skin and subcutaneous tissues	51
11734200	Disorders of the musculoskeletal system and connective tissues	37
11734300	Congenital abnormalities	29
11734400	Disorders and complications of pregnancy, childbirth and the puerperium	28
11734500	Perinatal morbidity and mortality (shortly before or after birth)	17
11734600	Burns	24
11734700	Poisoning	18
11734800	Shock and trauma	35
11735000	Surgery	30
11735100	Operative procedures (Also includes biopsy, removal of tumors, removal of organs, Caesarian section, removal of drains.)	22
11735200	Amputation and disarticulation	5
11735300	Repair surgery (Includes plastic surgery, pedicle revision, surgical graft, anastomosis, fistulization, open reduction, fixation, fusion, stabilization.)	9

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)

p. 5 of 16

Code No.	Category Name	Total Tasks
11735400	Introductory procedures (Includes injections, transfusion, irrigation, catheterization, intubation, tracheotomy.)	69
11735500	Endoscopy (direct visual observation of bronchi, esophagus, duodenum, colon with an endoscope)	15
11735600	Suture (Also includes ligature, suture materials.)	24
11735700	Manipulation (Includes application of plaster, splint or traction, dilation or stretching.)	20
11735800	Delivery methods for childbirth (Includes the circumstances governing the delivery method chosen such as abnormal presentation of baby (transverse section, breech), medical history of mother.) (For complications of childbirth caused by other conditions see Pathology, Normal structure and function.)	13
11736000	Anesthesiology (Includes open anesthetics, semiopen, insufflation, absorption, intravenous, infiltration, field and nerve block methods.) (For administering anesthesia see also Surgery.)	27
11737000	First aid and care (See also Pathology.)	46
11737100	Bandages, dressings, tourniquets and splints	39
11737200	Hemorrhage and bleeding and their arrest	45
11737300	Handling and transportation of the sick or wounded	55
11737400	Sprains, strains, fractures and their healing	21
11737500	Foreign bodies not involving wounds (in eye, throat)	21
11737600	Resuscitation	21
11737700	Wounds and their healing (Includes operative incisions.)	56

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY
OF PILOT TEST TASKS[a] (continued)
p. 6 of 16

Code No.	Category Name	Total Tasks
11738000	Asepsis (concepts and techniques involved in achievement of sterile condition) (Includes concurrent and terminal disinfection during surgery, aspects of sterilization of implements and equipment such as autoclaving.)	105
11739000	Community health and preventive medicine (For health education see topics of instruction and EDUCATION.)	7
11739100	Treatment of social causes of illness (primary level of prevention) (See also SOCIAL SCIENCES.)	4
11739300	Rehabilitation and restoration of individual to community (teritiary level of prevention) (See also Behavioral processes and Rehabilitation medicine.)	2
11739430	Sanitation (establishment and maintenance of environmental conditions which are favorable to health) (Includes methods of waste disposal, sanitary considerations for food and drink, insect and rodent control.) (For clinical sterilization techniques see Asepsis.)	33
11741000	Epidemiology (relationship of factors which determine the frequencies and distributions of infectious processes, diseases or other pathological states (e.g. lead poisoning) in human communities) (Includes immunization.) (See also Asepsis and Pathology.)	35
11742100	Physical therapy (Excludes speech therapy and hearing therapy.) (See also Mental retardation in the BEHAVIORAL SCIENCES and Special education in EDUCATION.)	16
11742110	Kinesiology and body mechanics (See also Musculo-skeletal system; for disability see Disorders of the musculo-skeletal system.)	4
11742120	Disability evaluation (testing and measurement to determine the extent and type of physical disability) (For psychological tests see BEHAVIORAL SCIENCES.)	5

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
p. 7 of 16

Code No.	Category Name	Total Tasks
11742131	Amputation adjustments (Includes artificial limbs and their use and artificial organs [where relevant] and their use.) (Note that this category excludes surgical procedures.)	7
11742132	Corrective, preventive and compensatory adjustments (Includes supportive and self-help devices and their use, such as wheel chairs, trusses, crutches and other mechanical devices and special measures to restore functioning, prevent malfunction (e.g. after surgery), and to make use of partial functions.)	28
11742133	Special post-disease and chronic disease therapy (special corrective procedures for the after-effects of diseases such as heart disease, rheumatic fever, epilepsy, blindness, diabetes, pulmonary tuberculosis.)	25
11742141	Hydrotherapy (Includes whirlpool baths.)	1
11742143	Heat therapy (Includes diathermy, infra-red, ultra-violet.)	5
11742148	Exercise (corrective therapeutic and normal) (Includes active, passive and stretching, active assistance, isometric, progressive resistive (proprioceptive, isotonic), coordination and balance, breathing, pre-natal and post partum, gait-training and locomotion exercise.)	20
11742210	Speech therapy	1
11742220	Hearing therapy	1
11743000	Nutrition and dietetics (See also CHEMISTRY, Normal structure and function, Cell biology.)	35
11743100	Biochemistry of nutrients (Includes carbohydrates, fats, proteins, minerals, vitamins, water.)	20

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS^{a} (continued)

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Code No.	Category Name	Total Tasks
11743200	Physiology of nutrients (Includes carbohydrates, fats, proteins, minerals, vitamins, water.)	20
11743300	Nutritional qualities of foods (Includes losses resulting from processing, the relationship between foods their preparation and their nutritive content.)	25
11743400	Nutritional requirements and diets (Includes normal and therapeutic nutrition for adults, pregnancy and lactation, infancy, childhood, adolescence, and geriatrics.)	46
11744100	Oral hygiene and care (See also Asepsis.)	17
11744200	Oral surgery (surgical and adjunctive treatment of diseases, injuries, and defects of the mouth, the jaws, and associated structures) (Includes fillings, pedontics, and corrective devices such as dentures, crowns, bridges.) (See also Surgery.)	2
11745000	Growth and development (Note that age ranges are approximate.) (For psychological aspects of growth and development see Behavioral processes.)	65
11745100	Embryology and prenatal period (For experimental embryology see Cell Biology.) (See also Chemical teratogenesis.)	22
11745200	Neo-natal period (birth through first month)	20
11745300	Infant growth (second month through second year)	15
11745400	Childhood growth	17
11745500	Adolescent growth	16
11745600	Adulthood	15
11745700	Old age (geriatrics)	12
11800000	Microbiology (Includes physiology of microorganisms such as protozoa, fungi, algae, bacteria.) (For parasitology see Infective and parasitic diseases.)	26

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
11900000	Molecular biology (Includes viruses; the genetics of bacteria, and molecular and microbial genetics.) (For biophysical aspects of molecular biology see CHEMISTRY.)	1
12100000	Cell biology (cytology and histology)	7
12110000	Cell morphology (structure)	4
12120000	Cell physiology	2
12200000	Radiology (See also PHYSICS, ENGINEERING AND TECHNOLOGY, and CHEMISTRY.)	24
12210000	Radiobiology (general and injurious effects of high energy radiation on living organisms) (Includes the therapeutic aspects of nuclear medicine.)	16
12220000	Radiographic (X-ray) analysis (Includes positioning to achieve interpretable results of x-ray and fluoroscopy and the interpretation of the structures shown in the images produced.)	35
12230000	Radioisotope scanning (Includes the diagnostic aspects of nuclear medicine.)	2
12300000	Pharmacology (the study of drugs, i.e. chemical compounds or non-infectious biological substances which may be administered as an aid in the diagnosis, treatment or prevention of disease, for the relief of pain or suffering or to control or improve any physiological or pathological condition) (See also Normal structure and function, Pathology, Cell biology and CHEMISTRY.)	61
12311000	Drug receptor theory (Includes bond types in drug receptor interaction.)	7
12312000	Drug structure-activity relationships	7
12313000	Drug dose-response relationships	19

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
12314000	Non-receptor mediated drug action	7
12321000	Drug absorption (Includes physiochemical nature of the drug, physiochemical nature of absorbing membrane, route of administration.)	20
12322000	Drug distribution (Includes volume of distribution, drug-plasma protein interaction, drug-membrane interactions, drug deposition and storage.)	17
12323000	Drug excretion (Includes physiochemical nature of the drug, routes of elimination.)	15
12324000	Drug metabolism (Includes oxidation, reduction, hydrolysis, conjugation.)	7
12331000	Drug toxicity (Includes antidotal therapy.)	44
12332000	Drug idiosyncrasy and allergy pharmacogenetics (Includes increased sensitivity to drugs, decreased responsiveness to drugs, novel drug effects, etc. which are due to inherited physical characteristics.)	45
12333000	Drug resistance (of a non-genetic nature) (Includes mutational origins.) (For biochemical mechanisms, see CHEMISTRY.)	26
12334000	Drug tolerance and physical dependence (Includes homeostatic adjustment, cumulative effects, tolerance at the site of drug action.)	33
1233500	Drug synergism (presence of two or more drugs in the body having the same effects and the change in drug action this causes)	25
12336000	Chemical teratogenesis (special effects of drugs on the fetus during pregnancy)	10
12338000	Chemical carcinogenesis (the range of drugs which can induce tumors)	1

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
12341100	Antibacterial and antifungal chemotherapy (Includes antiseptics and germicides, sulfonamides, penicillins, erythromycin, tetracyclines and broad spectrum antibiotics, streptomycin, sulfones, antifungal agents.)	36
12341200	Antiprotozoal/antimetazoal chemotherapy (Includes antimalarials, amebicides, heavy metals, metal-binding agents, antimonials, anthelmintics.)	29
12341300	Cancer and virus chemotherapy (Includes alkylating agents, antimetabolites, steroids and enzymes, interferon induction.)	6
12341400	Local chemotherapy (Includes insecticides, repellents, and rodenticides, topical agents.)	18
12342100	Drugs acting on the cardiovascular system and smooth muscle (Includes cardiac glycosides, quinidine and anti-arrhythmia agents, coronary vasodilators, diuretics, agents inhibiting the renal tubules, fluids (such as blood, substitutes, electrolytes), agents in atherosclerosis, hypotensive agents, smooth muscle relaxants, smooth muscle stimulants.)	31
12342200	Drugs acting on the blood (Includes agents in anemia, anticoagulants and coagulants.) (For this pilot test also includes drugs acting on the immunologic system.)	28
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs (Includes adrenal cortical hormones and corticotropin, thyroid and thyrotropic hormones, sex hormones and gonadotropins, anterior pituitary, agents in diabetes mellitus, parathyroid hormone and calcium metabolism.)	37
12342400	Vitamins and nutritional agents (Refers only to the pharmaceutical aspects.) (Includes vitamins, agents in nutrition and obesity.) (For nutritional and dietary aspects see Nutrition and dietetics.)	26
12342500	Drugs influencing growth and development	8

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
12342600	Drugs for allergy, cough, vomiting and the dermatomucosal surfaces (Includes anti-immune drugs, antitussives, antiemetics, dermatomucosal agents.)	29
12342700	Drugs acting on the gastrointestinal tract (Includes drugs effective in ulcer therapy, cathartics and laxatives, digestants and drugs useful in gall bladder disease.)	30
12342800	Drugs acting on the nervous system (For anesthetics see Anesthesiology.)	30
12342810	Drugs acting on the autonomic nervous system (Includes sympathetic stimulants, sympathetic depressants, parasympathetic stimulants, parasympathetic depressants, ganglionic agents.)	12
12342820	Drugs acting on the neuromuscular system (Includes myoneural agents, muscle relaxants.)	14
12342830	Drugs acting on the central nervous system (Includes narcotic analgesics, non-narcotic analgesics, sedatives and hypnotics, anticonvulsants, tranquilizers, drug addiction, alcohol, psychomimetic agents, drugs affecting the mind.)	13
13900000	Biochemical processes and mechanisms	16
14111000	Solutions (mechanical, optical, colligative properties; dilute, normal, molar, saturated and supersaturated solutions, whether liquid, solid or gaseous phase) (For analytical tests relying upon one or more of these properties see Chemical analysis and preparation of samples.)	5
14121000	Mechanical analysis (tests of mechanical properties of matter) (Includes gravimetrics, weight and specific gravity, strength, hardness, brittleness, ductility; microscopic analysis of physical properties.) (See also Descriptive physics for physical knowledge of properties.)	1

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
14128000	Separation methods in analysis (Includes selective absorption, distillation and evaporation, extraction by solvents, separation by ion exchange, chromatography and diffusion analysis, precipitation methods.)	5
15212100	Electric circuit theory (Includes Ohm's law, Kirchhoff's laws, impedance, inductance, resistance, ammeters, voltmeters, potentiometers, bridges, alternating current circuits, direct current circuits, wave-guides, transmission lines.)	10
15214200	Optics (Includes electromagnetic radiation, spectra: infrared, light, ultraviolet; x-ray radiation, polarization of light, reflection and refraction, black-body radiation, lasers, radiation from an oscillating charge distribution.)	11
15315000	Optical properties (Includes transparency, index of refraction, prism action, filters, double refraction, dispersion, absorptive edges, flourescence, phosphorescence; geometrical optics (ray tracing), Snell's law, image formation, focal points, correction of an optical system.) (See also Optics of Classical wave theory and Interaction with radiation.)	11
24130000	Electronics	1
41521200	Infant and preschool intelligence and their measurement	3
41522000	Differential abilities and aptitudes and their measurement (Includes tests of sensory capacities, motor functions, mechanical aptitudes, clerical aptitudes, artistic aptitudes, musical aptitudes, literary appreciation, creativity, reasoning.)	4
41523000	Achievement and achievement measurement (Includes tests of General Educational Development, California Achievement Tests, Iowa Tests of Basic Skills, Stanford Achievement Tests, proficiency examinations, performance evaluation, High School Equivalency, Scholastic Aptitude Tests, Graduate Record Examinations, licensure examinations.)	2

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
41610000	Sensation and perception	4
41642000	Sex drives (Includes conditions of arousal of, selective and directional behavior of, satiation and gratification of sex drives.)	4
41650000	Emotions (Includes conditions of arousal of emotions, disruptive and adaptive aspects of emotions, mood change.)	3
41660000	Development and growth of behavioral processes of the individual (See also Normal structure and function and Growth and development.)	21
41666100	Infant behavioral development (Includes mother-child interaction, adaptive behavior.)	12
41666200	Childhood behavioral development	9
41666300	Adolescent behavioral development	8
41666400	Young adulthood behavioral development	6
41666500	Adult behavioral development	4
41666600	Old age behavioral development	4
41690000	Psychopathology (For Neurological disorders see Pathology.)	36
41691000	Mental retardation (See also Pathology in BIOLOGICAL SCIENCES.)	12
41692000	Organic brain syndrome (See also Pathology in BIOLOGICAL SCIENCES.)	9
41693000	Psychoses (Includes schizophrenia, affective disorders, paranoid states.) (Excludes psychoses of organic brain syndromes.)	9
41694000	Neuroses	9

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
41695100	Personality disorders (Includes personality disorders such as the obsessive-compulsive, asthenic, passive-aggressive personality.) (Note that this category excludes neuroses and psychoses.)	4
41695200	Disorders involving addictive behavior (Includes alcoholism, drug dependence.) (See also Pharmacology.)	13
41696000	Psychosomatic disorders (psychophysiological disorders)	11
41697000	Transient situational disturbances (temporary psychopathological disturbances due to acute situational stress)	12
41710000	Psychotherapy and counseling	19
41720000	Organic therapy (Includes chemotherapy, insulin and sub-insulin shock therapy, electroshock therapy.) (See also Pharmacology.) (For surgical treatment see Surgery, Normal structure and function.)	4
41884000	Social service administration and policy (See also ECONOMICS and POLITICAL SCIENCE when applicable; see also Psychotherapy and counseling.)	21
41884100	Social services for the poor or indigent, administration and policy (Includes welfare.)	10
41884200	Health services administration and policy (Includes public health and family health services, hospital-based services.)	26
41884300	Educational and training services administration and policy (For Methods of education and training see EDUCATION.)	9
41884400	Employment services administration and policy	9
41884500	Legal services administration and policy	10
41884600	Child care services administration and policy	10

Table A.3. KNOWLEDGE CATEGORIES REQUIRED BY ANY OF PILOT TEST TASKS[a] (continued)
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Code No.	Category Name	Total Tasks
41884700	Recreational services administration and policy	9
41884800	Special services for the aged or infirm administration and policy	10
41884900	Consumer protection services administration and policy (See also ECONOMICS.)	10
41885100	Social agencies (public and private) administration and policy	13
42300000	Systems of content presentation (Includes procedures such as lecture, symposium, panel, forum, role-playing, case study, demonstration, colloquium, audio-visual techniques, programmed instruction, micro-labs and laboratory methods.)	3
42630000	Professional and graduate education	3
43700000	Consumer economics (Includes consumer protection, business practices related to consumer interests, money management for the household.)	4
65620000	Mechanics of writing English (Includes traditional (prescriptive) grammar, punctuation, spelling, bibliographic and footnote form.) (For mechanics of writing other languages see Languages; for the study of grammar see Linguistics.)	95
69214200	Spanish	1
72000000	CUISINE (cooking and baking) (Includes all of the types and techniques of food preparation; recipes, including regional or special cuisines.) (For the effects of preparation on nutritional content see Nutrition and dietetics.)	3

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[a] Presented by order of appearance in HSMS Knowledge Classification System. The "Total Tasks" column refers to the number of the entire 273 tasks which require the category at some level on the HSMS Knowledge Scale.

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (Surgery, Diagnosis and Prescription Specialty: 15 Tasks) p. 1 of 9

Category Number	Category Name[a]	*	Total Tasks
2	Object Manipulation		15
4	Human Interaction		15
5	Leadership	*	15
6	Oral Use of a Relevant Language		15
7	Reading Use of a Relevant Language		14
8	Written Use of a Relevant Language		14
9	Decision Making on Methods		15
10	Decision Making on Quality		15
11	Figural Skills	*	15
12	Symbolic Skills	*	15
13	Taxonomic Skills	*	15
14	Implicative Skills	*	15
15	Financial Consequences of Error		15
16	Consequences of Error To Humans		15
11200000	Genetics		7
11731000	Normal structure and function	*	15
11731100	Regional anatomy	*	15
11731200	Topographic anatomy	*	15
11731300	Hematopoietic system	*	12
11731400	Circulatory system	*	15

[a] See Tables A.2and A.3for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)
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Category Number	Category Name[a]	*	Total Tasks
11731500	Respiratory system	*	15
11731600	Digestive system	*	15
11731610	Mouth, pharynx (digestive function), esophagus	*	12
11731620	Stomach and small intestine	*	12
11731630	Large intestine (colon) and rectum	*	12
11731640	Liver, biliary system, and pancreas	*	12
11731700	Urinary system and external genitalia	*	15
11731810	Muscles	*	15
11731820	Bones and joints	*	14
11731831	Skin and sweat glands	*	14
11731832	Hair		3
11731833	Nails		3
11731900	Nervous system	*	15
11731910	Central nervous system (brain and spinal cord)	*	14
11731920	Peripheral nervous system	*	14
11731930	Autonomic nervous system	*	14
11731941	Olfactory nerve and receptors		4
11731942	Taste buds		3
11731943	Eye and optic nerve	*	13
11731944	Touch, heat, cold and pain receptors		4
11731945	The ear (excluding balance function)	*	13
11731946	Kinesthetic receptors		4

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)
p. 3 of 9

Category Number	Category Name[a]	*	Total Tasks
11732100	Immunologic system	*	13
11732210	Endocrine glands and their hormone physiology	*	14
11732220	Reproduction	*	14
11732221	Conception and contraception		9
11732222	Male reproductive system		7
11732223	Female reproductive system	*	14
11732300	Homeostasis of fluids	*	14
11732400	Metabolism	*	15
11733000	Pathology	*	15
11733100	Infective and parasitic diseases	*	14
11733200	Neoplasms (cancerous growths)	*	14
11733300	Endocrine, nutritional, and metabolic disorders	*	15
11733400	Disorders of blood and blood-forming organs		5
11733510	Disorders of the central nervous system	*	15
11733520	Disorders of the peripheral nervous system	*	14
11733530	Disorders of the autonomic nervous system	*	15
11733541	Disorders of the olfactory nerve and receptors		3
11733542	Disorders of the taste buds		3
11733543	Disorders of the eye and optic nerve		5
11733544	Disorders of touch, heat, cold and pain receptors		4
11733545	Disorders of the ear		5
11733546	Disorders of kinesthetic receptors		4

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)
p. 4 of 9

Category Number	Category Name[a]	*	Total Tasks
11733600	Disorders of the circulatory system	*	15
11733700	Disorders of the digestive system	*	15
11733800	Disorders of the respiratory system	*	14
11733900	Disorders of the uro-genital system	*	14
11734100	Disorders of the skin and subcutaneous tissues	*	13
11734200	Disorders of the musculoskeletal system and connective tissues	*	14
11734300	Congenital abnormalities		8
11734400	Disorders and complications of pregnancy, childbirth, puerperium		8
11734500	Perinatal morbidity and mortality		5
11734600	Burns		4
11734700	Poisoning		4
11734800	Shock and trauma	*	15
11735000	Surgery	*	15
11735100	Operative procedures	*	11
11735200	Amputation and disarticulation		3
11735300	Repair surgery		5
11735400	Introductory procedures	*	15
11735500	Endoscopy	*	10
11735600	Suture	*	11
11735700	Manipulation	*	11
11735800	Delivery methods for childbirth		5

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)

p. 5 of 9

Category Number	Category Name[a]	*	Total Tasks
11736000	Anesthesiology	*	11
11737000	First aid and care	*	14
11737100	Bandages, dressings, tourniquets and splints	*	11
11737200	Hemorrhage and bleeding and their arrest	*	15
11737300	Handling and transportation of the sick or wounded		7
11737400	Sprains, strains, fractures and their healing		4
11737500	Foreign bodies not involving wounds		3
11737600	Resuscitation	*	9
11737700	Wounds and their healing	*	15
11738000	Asepsis	*	15
11739000	Community health and preventive medicine		1
11739430	Sanitation		3
11741000	Epidemiology		6
11742100	Physical therapy		4
11742120	Disability evaluation		2
11742131	Amputation adjustments		4
11742132	Corrective, preventive and compensatory adjustments		5
11742133	Special post-disease and chronic disease therapy		5
11742143	Heat therapy		3
11742148	Exercise		7
11743000	Nutrition and dietetics	*	15
11743100	Biochemistry of nutrients	*	14

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)
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Category Number	Category Name[a]	*	Total Tasks
11743200	Physiology of nutrients	*	14
11743300	Nutritional qualities of foods		2
11743400	Nutritional requirements and diets	*	13
11744100	Oral hygiene and care		4
11745000	Growth and development	*	15
11745100	Embryology and prenatal period	*	8
11745200	Neo-natal period		3
11745400	Childhood growth		3
11745500	Adolescent growth		5
11745600	Adulthood		5
11745700	Old age (geriatrics)		4
11800000	Microbiology		6
12100000	Cell biology		2
12110000	Cell morphology		2
12120000	Cell physiology		1
12200000	Radiology		8
12210000	Radiobiology		4
12220000	Radiographic (X-ray) analysis	*	13
12300000	Pharmacology	*	15
12311000	Drug receptor theory		5
12312000	Drug structure-activity relationships		5
12313000	Drug dose-response relationships	*	15

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)
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Category Number	Category Name[a]	*	Total Tasks
12314000	Non-receptor mediated drug action		5
12321000	Drug absorption	*	15
12322000	Drug distribution	*	13
12323000	Drug excretion	*	13
12324000	Drug metabolism		5
12331000	Drug toxicity	*	15
12332000	Drug idiosyncrasy and allergy pharmacogenetics	*	15
12333000	Drug resistance (of a non-genetic nature)	*	14
12334000	Drug tolerance and physical dependence	*	14
12335000	Drug synergism	*	15
12336000	Chemical teratogenesis		5
12341100	Antibacterial and antifungal chemotherapy	*	14
12341200	Antiprotozoal/antimetazoal chemotherapy	*	14
12341400	Local chemotherapy		6
12342100	Drugs acting on the cardiovascular system and smooth muscle	*	14
12342200	Drugs acting on the blood and immunologic system	*	14
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs	*	15
12342400	Vitamins and nutritional agents	*	14
12342500	Drugs influencing growth and development		3

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)

p. 8 of 9

Category Number	Category Name^a	*	Total Tasks
12342600	Drugs for allergy, cough, vomiting and the dermatomucosal surfaces	*	14
12342700	Drugs acting on the gastrointestinal tract	*	14
12342800	Drugs acting on the nervous system	*	15
12342810	Drugs acting on the autonomic nervous system		4
12342820	Drugs acting on the neuromuscular system		5
12342830	Drugs acting on the central nervous system		4
13900000	Biochemical processes and mechanisms	*	13
14111000	Solutions		1
14128000	Separation methods in analysis		1
41642000	Sex drives		3
41650000	Emotions		3
41660000	Development and growth of behavioral processes of the individual		3
41690000	Psychopathology		6
41691000	Mental retardation		4
41692000	Organic brain syndrome		3
41693000	Psychoses		4
41694000	Neuroses		5
41695200	Disorders involving addictive behavior		6
41696000	Psychosomatic disorders	*	7
41697000	Transient situational disturbances	*	6
41710000	Psychotherapy and counseling		3

Table A.4. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR ONE (continued)

p. 9 of 9

Category Number	Category Name[a]	*	Total Tasks
41884200	Health services administration and policy		4
42630000	Professional and graduate education		2
65620000	Mechanics of writing English	*	15
Total:	14 skills and 158 Knowledge Categories		

[a] See Tables A.2 and A.3 for further descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES
REQUIRED FOR TASKS OF FACTOR TWO
(Pediatric Specialty in Diagnosis and Prescription: 11 Tasks)
p. 1 of 9

Category Number	Category Name[a]	*	Total Tasks
2	Object Manipulation		9
4	Human Interaction		11
5	Leadership		11
6	Oral Use of a Relevant Language		11
7	Reading Use of a Relevant Language		11
8	Written Use of a Relevant Language		11
9	Decision Making on Methods		11
10	Decision Making on Quality		11
11	Figural Skills		10
12	Symbolic Skills		8
13	Taxonomic Skills		11
14	Implicative Skills		11
15	Financial Consequences of Error		11
16	Consequences of Error To Humans		11
11200000	Genetics	*	3
11731000	Normal structure and function		11
11731100	Regional anatomy		10
11731200	Topographic anatomy		10
11731300	Hematopoietic system	*	7
11731400	Circulatory system		11
11731500	Respiratory system		11

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[a] See Tables A.2 and A.3 for fuller descriptions.
* Asterisk designates variable determining factor at ±.41 or higher.

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)
p. 2 of 9

Category Number	Category Name[a]	*	Total Tasks
11731600	Digestive system		11
11731610	Mouth, pharynx (digestive function), esophagus		5
11731620	Stomach and small intestine		5
11731630	Large intestine (colon) and rectum		5
11731640	Liver, biliary system, and pancreas		5
11731700	Urinary system and external genitalia		11
11731810	Muscles		11
11731820	Bones and joints		11
11731831	Skin and sweat glands		11
11731832	Hair		7
11731833	Nails		8
11731900	Nervous system		11
11731910	Central nervous system (brain and spinal cord)		6
11731920	Peripheral nervous system		6
11731930	Autonomic nervous system		6
11731941	Olfactory nerve and receptors		4
11731942	Taste buds		2
11731943	Eye and optic nerve	*	7
11731944	Touch, heat, cold and pain receptors		2
11731945	The ear (excluding balance function)	*	7
11731946	Kinesthetic receptors		5
11732100	Immunologic system	*	11

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)

p. 3 of 9

Category Number	Category Name[a]	*	Total Tasks
11732210	Endocrine glands and their hormone physiology		11
11732220	Reproduction		10
11732221	Conception and contraception	*	8
11732222	Male reproductive system	*	10
11732223	Female reproductive system		10
11732300	Homeostasis of fluids		7
11732400	Metabolism		9
11733000	Pathology		11
11733100	Infective and parasitic diseases		11
11733200	Neoplasms (cancerous growths)		10
11733300	Endocrine, nutritional, and metabolic disorders		11
11733400	Disorders of blood and blood-forming organs	*	11
11733510	Disorders of the central nervous system		11
11733520	Disorders of the peripheral nervous system	*	11
11733530	Disorders of the autonomic nervous system		11
11733541	Disorders of the olfactory nerve and receptors		3
11733542	Disorders of the taste buds		2
11733543	Disorders of the eye and optic nerve	*	11
11733544	Disorders of touch, heat, cold and pain receptors		2
11733545	Disorders of the ear	*	10
11733546	Disorders of kinesthetic receptors		2
11733600	Disorders of the circulatory system		11

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)

p. 4 of 9

Category Number	Category Name[a]	*	Total Tasks
11733700	Disorders of the digestive system	*	11
11733800	Disorders of the respiratory system		11
11733900	Disorders of the uro-genital system		11
11734100	Disorders of the skin and subcutaneous tissues		11
11734200	Disorders of the musculoskeletal system and connective tissues	*	11
11734300	Congenital abnormalities	*	9
11734400	Disorders and complications of pregnancy, childbirth, puerperium		7
11734500	Perinatal morbidity and mortality		6
11734600	Burns	*	9
11734700	Poisoning	*	9
11734800	Shock and trauma		8
11735000	Surgery		4
11735100	Operative procedures		1
11735400	Introductory procedures		8
11735500	Endoscopy		3
11735600	Suture		6
11735700	Manipulation		5
11735800	Delivery methods for childbirth		1
11736000	Anesthesiology		2
11737000	First aid and care		9
11737100	Bandages, dressings, tourniquets and splints		7

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)

p. 5 of 9

Category Number	Category Name[a]	*	Total Tasks
11737200	Hemorrhage and bleeding and their arrest		8
11737300	Handling and transportation of the sick or wounded	*	9
11737400	Sprains, strains, fractures and their healing	*	8
11737500	Foreign bodies not involving wounds	*	7
11737600	Resuscitation		5
11737700	Wounds and their healing		10
11738000	Asepsis		10
11739000	Community health and preventive medicine		1
11739100	Treatment of social causes of illness		2
11739430	Sanitation	*	8
11741000	Epidemiology	*	11
11742100	Physical therapy	*	6
11742120	Disability evaluation		1
11742132	Corrective, preventive and compensatory adjustments	*	8
11742133	Special post-disease and chronic disease therapy	*	10
11742148	Exercise	*	7
11742210	Speech therapy		1
11742220	Hearing therapy		1
11743000	Nutrition and dietetics		6
11743100	Biochemistry of nutrients		5
11743200	Physiology of nutrients		5
11743300	Nutritional qualities of foods	*	10

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)
p. 6 of 9

Category Number	Category Name[a]	*	Total Tasks
11743400	Nutritional requirements and diets	*	10
11744100	Oral hygiene and care	*	9
11745000	Growth and development		11
11745100	Embryology and prenatal period		7
11745200	Neo-natal period	*	8
11745300	Infant growth (second month through second year)	*	9
11745400	Childhood growth	*	9
11745500	Adolescent growth	*	9
11745600	Adulthood	*	8
11745700	Old age (geriatrics)	*	5
11800000	Microbiology	*	6
12100000	Cell biology		2
12220000	Radiographic (X-ray) analysis		5
12300000	Pharmacology		11
12311000	Drug receptor theory		2
12312000	Drug structure-activity relationships		2
12313000	Drug dose-response relationships		2
12314000	Non-receptor mediated drug action		2
12321000	Drug absorption		2
12322000	Drug distribution		2
12323000	Drug excretion		2
12324000	Drug metabolism		2

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)
p. 7 of 9

Category Number	Category Name[a]	*	Total Tasks
12331000	Drug toxicity		11
12332000	Drug idiosyncrasy and allergy pharmacogenetics		11
12333000	Drug resistance (of a non-genetic nature)	*	11
12334000	Drug tolerance and physical dependence	*	11
12335000	Drug synergism		7
12336000	Chemical teratogenesis		3
12341100	Antibacterial and antifungal chemotherapy		10
12341200	Antiprotozoal/antimetazoal chemotherapy	*	10
12341300	Cancer and virus chemotherapy		6
12341400	Local chemotherapy	*	10
12342100	Drugs acting on the cardiovascular system and smooth muscle		9
12342200	Drugs acting on the blood and immunologic system		9
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs		10
12342400	Vitamins and nutritional agents	*	9
12342500	Drugs influencing growth and development		5
12342600	Drugs for allergy, cough, vomiting and the dermatomucosal surfaces	*	9
12342700	Drugs acting on the gastrointestinal tract	*	9
12342800	Drugs acting on the nervous system		8
12342810	Drugs acting on the autonomic nervous system		3
12342820	Drugs acting on the neuromuscular system		4

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)

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Category Number	Category Name[a]	*	Total Tasks
12342830	Drugs acting on the central nervous system		3
13900000	Biochemical processes and mechanisms		2
41521200	Infant and preschool intelligence and measurement		2
41522000	Differential abilities and aptitudes and their measurement		3
41523000	Achievement and achievement measurement		2
41610000	Sensation and perception		3
41660000	Development and growth of behavioral processes of the individual	*	10
41666100	Infant behavioral development		8
41666200	Childhood behavioral development		8
41666300	Adolescent behavioral development		8
41666400	Young adulthood behavioral development		6
41666500	Adult behavioral development		4
41666600	Old age behavioral development		4
41690000	Psychopathology	*	11
41691000	Mental retardation	*	6
41692000	Organic brain syndrome	*	5
41693000	Psychoses		4
41694000	Neuroses		4
41695100	Personality disorders		4
41695200	Disorders involving addictive behavior		6
41696000	Psychosomatic disorders	*	4

Table A.5. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR TWO (continued)

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Category Number	Category Name[a]	*	Total Tasks
41697000	Transient situational disturbances	*	6
41710000	Psychotherapy and counseling	*	7
41720000	Organic therapy		3
41884000	Social service administration and policy		3
41884100	Social services for the poor or indigent, administration and policy		2
41884200	Health services administration and policy		5
41884300	Educational and training services administration, policy		3
41884400	Employment services administration and policy		2
41884500	Legal services administration and policy		2
41884600	Child care services administration and policy		3
41884700	Recreational services administration and policy		3
41884800	Special services for the aged or infirm administration, policy		2
41884900	Consumer protection services administration, policy		2
41885100	Social agencies (public and private) administration, policy		3
42300000	Systems of content presentation		3
42630000	Professional and graduate education		1
43700000	Consumer economics		2
65620000	Mechanics of writing English		10
Total:	14 skills and 175 Knowledge Categories		

[a] See Tables A.2 and A.3 for fuller descriptions

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.6. SKILLS AND KNOWLEDGE CATEGORIES
REQUIRED FOR TASKS OF FACTOR THREE
(Specialty in Machine Related Care and Radiology: 26 Tasks)
p. 1 of 5

Category Number	Category Name[a]	*	Total Tasks
2	Object Manipulation		20
3	Guiding or Steering		1
4	Human Interaction		23
5	Leadership		6
6	Oral Use of a Relevant Language		23
7	Reading Use of a Relevant Language		23
8	Written Use of a Relevant Language		17
9	Decision Making on Methods		25
10	Decision Making on Quality		26
11	Figural Skills	*	19
12	Symbolic Skills		11
13	Taxonomic Skills	*	7
14	Implicative Skills		19
15	Financial Consequences of Error		22
16	Consequences of Error To Humans		25
11200000	Genetics		2
11731000	Normal structure and function		14
11731100	Regional anatomy		12
11731200	Topographic anatomy	*	14
11731300	Hematopoietic system		3

[a] See Tables A.2and A.3for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.6. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR THREE (continued)

p. 2 of 5

Category Number	Category Name[a]	Total * Tasks
11731400	Circulatory system	3
11731500	Respiratory system	3
11731600	Digestive system	7
11731610	Mouth, pharynx (digestive function), esophagus	3
11731620	Stomach and small intestine	5
11731630	Large intestine (colon) and rectum	5
11731640	Liver, biliary system, and pancreas	4
11731700	Urinary system and external genitalia	5
11731820	Bones and joints	4
11731831	Skin and sweat glands	1
11731900	Nervous system	2
11731941	Olfactory nerve and receptors	2
11731943	Eye and optic nerve	3
11731945	The ear (excluding balance function)	3
11732210	Endocrine glands and their hormone physiology	1
11732220	Reproduction	3
11732221	Conception and contraception	1
11732222	Male reproductive system	2
11732223	Female reproductive system	4
11733000	Pathology	14
11733100	Infective and parasitic diseases	5
11733200	Neoplasms (cancerous growths)	6

Table A.6. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR THREE (continued)

p. 3 of 5

Category Number	Category Name[a]	Total * Tasks
11733300	Endocrine, nutritional, and metabolic disorders	4
11733400	Disorders of blood and blood-forming organs	3
11733510	Disorders of the central nervous system	2
11733520	Disorders of the peripheral nervous system	2
11733530	Disorders of the autonomic nervous system	2
11733541	Disorders of the olfactory nerve and receptors	2
11733543	Disorders of the eye and optic nerve	5
11733545	Disorders of the ear	2
11733600	Disorders of the circulatory system	4
11733700	Disorders of the digestive system	4
11733800	Disorders of the respiratory system	3
11733900	Disorders of the uro-genital system	4
11734100	Disorders of the skin and subcutaneous tissues	1
11734200	Disorders of the musculoskeletal system and connective tissues	3
11734300	Congenital abnormalities	6
11734400	Disorders and complications of pregnancy, childbirth, puerperium	2
11734600	Burns	1
11734700	Poisoning	1
11734800	Shock and trauma	2
11735000	Surgery	5
11735100	Operative procedures	2

Table A.6. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR THREE (continued)

p. 4 of 5

Category Number	Category Name[a]	*	Total Tasks
11735200	Amputation and disarticulation		2
11735300	Repair surgery		2
11735400	Introductory procedures		5
11735500	Endoscopy		1
11735700	Manipulation		2
11737000	First aid and care		1
11737300	Handling and transportation of the sick or wounded		8
11737400	Sprains, strains, fractures and their healing		3
11737500	Foreign bodies not involving wounds		3
11738000	Asepsis		2
11742100	Physical therapy		2
11742110	Kinesiology and body mechanics		2
11742120	Disability evaluation		2
11742131	Amputation adjustments		3
11742132	Corrective, preventive and compensatory adjustments		3
11744200	Oral surgery		2
11745000	Growth and development		7
11800000	Microbiology		1
12100000	Cell biology		1
12200000	Radiology	*	12
12210000	Radiobiology	*	10
12220000	Radiographic (X-ray) analysis	*	13

Table A.6. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR THREE (continued)
p. 5 of 5

Category Number	Category Name[a]	*	Total Tasks
12230000	Radioisotope scanning		2
12300000	Pharmacology		2
12321000	Drug absorption		2
12322000	Drug distribution		2
12331000	Drug toxicity		1
12332000	Drug idiosyncrasy and allergy pharmacogenetics		2
12336000	Chemical teratogenesis		1
12338000	Chemical carcinogenesis		1
12342100	Drugs acting on the cardiovascular system and smooth muscle		1
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs		2
12342700	Drugs acting on the gastrointestinal tract		2
14111000	Solutions		3
15212100	Electric circuit theory	*	9
15214200	Optics	*	11
15315000	Optical properties	*	11
65620000	Mechanics of writing English		9
Total:	15 skills and 86 Knowledge Categories		

[a] See Tables A.2 and A.3 for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR
(Social Service and Counseling Specialty: 60 tasks)
p. 1 of 7

Category Number	Category Name[a]	*	Total Tasks
2	Object Manipulation		16
4	Human Interaction	*	60
5	Leadership		14
6	Oral Use of a Relevant Language	*	60
7	Reading Use of a Relevant Language	*	57
8	Written Use of a Relevant Language	*	50
9	Decision Making on Methods	*	60
10	Decision Making on Quality	*	60
11	Figural Skills		7
12	Symbolic Skills		8
13	Taxonomic Skills		14
14	Implicative Skills	*	50
15	Financial Consequences of Error		38
16	Consequences of Error to Humans		60
11200000	Genetics		1
11731000	Normal structure and function		19
11731100	Regional anatomy		9
11731200	Topographic anatomy		3
11731400	Circulatory system		4
11731500	Respiratory system		6

[a] See Tables A.2 and A.3 for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)
p. 2 of 7

Category Number	Category Name[a]		Total Tasks
		*	
11731600	Digestive system		3
11731700	Urinary system and external genitalia		5
11731810	Muscles		1
11731820	Bones and joints		1
11731831	Skin and sweat glands		2
11731900	Nervous system		3
11732100	Immunologic system		1
11732210	Endocrine glands and their hormone physiology		2
11732220	Reproduction		8
11732221	Conception and contraception		5
11732222	Male reproductive system		5
11732223	Female reproductive system		6
11733000	Pathology	*	30
11733100	Infective and parasitic diseases		7
11733200	Neoplasms (cancerous growths)		3
11733300	Endocrine, nutritional, and metabolic disorders		3
11733400	Disorders of blood and blood-forming organs		2
11733510	Disorders of the central nervous system		2
11733520	Disorders of the peripheral nervous system		1
11733530	Disorders of the autonomic nervous system		1
11733543	Disorders of the eye and optic nerve		1
11733600	Disorders of the circulatory system		4

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)

p. 3 of 7

Category Number	Category Name^a	Total * Tasks
11733700	Disorders of the digestive system	4
11733800	Disorders of the respiratory system	6
11733900	Disorders of the uro-genital system	6
11734100	Disorders of the skin and subcutaneous tissues	4
11734200	Disorders of the musculoskeletal system and connective tissues	3
11734300	Congenital abnormalities	2
11734400	Disorders and complications of pregnancy, childbirth, puerperium.	1
11734600	Burns	1
11734700	Poisoning	1
11735000	Surgery	2
11735100	Operative procedures	1
11735400	Introductory procedures	5
11736000	Anesthesiology	1
11737000	First aid and care	8
11737300	Handling and transportation of the sick or wounded	5
11737400	Sprains, strains, fractures and their healing	1
11737700	Wounds and their healing	6
11738000	Asepsis	9
11739000	Community health and preventive medicine	3
11739100	Treatment of social causes of illness	2

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)
p. 4 of 7

Category Number	Category Name[a]	Total * Tasks
11739300	Rehabilitation and restoration of individual to community	2
11739430	Sanitation	14
11741000	Epidemiology	10
11742100	Physical therapy	4
11742110	Kinesiology and body mechanics	1
11742132	Corrective, preventive and compensatory adjustments	5
11742133	Special post-disease and chronic disease therapy	8
11742148	Exercise	3
11743000	Nutrition and dietetics	7
11743300	Nutritional qualities of foods	7
11743400	Nutritional requirements and diets	14
11744100	Oral hygiene and care	3
11745000	Growth and development	11
11745100	Embryology and prenatal period	2
11745200	Neo-natal period	1
11745300	Infant growth (second month through second year)	1
11745400	Childhood growth	1
11745500	Adolescent growth	2
11745600	Adulthood	1
11745700	Old age (geriatrics)	3
11800000	Microbiology	1
12200000	Radiology	1

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)

p. 5 of 7

Category Number	Category Name[a]	Total * Tasks
12210000	Radiobiology	1
12220000	Radiographic (X-ray) analysis	1
12300000	Pharmacology	13
12331000	Drug toxicity	4
12332000	Drug idiosyncrasy and allergy pharmacogenetics	4
12334000	Drug tolerance and physical dependence	2
12335000	Drug synergism	1
12341100	Antibacterial and antifungal chemotherapy	1
12341200	Antiprotozoal/antimetazoal chemotherapy	1
12341400	Local chemotherapy	1
12342100	Drugs acting on the cardiovascular system and smooth muscle	1
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs	4
12342800	Drugs acting on the nervous system	1
12342810	Drugs acting on the autonomic nervous system	2
12342820	Drugs acting on the neuromuscular system	1
12342830	Drugs acting on the central nervous system	2
41521200	Infant and preschool intelligence and their measurement	1
41522000	Differential abilities and aptitudes and their measurement	1
41610000	Sensation and perception	1

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)
p. 6 of 7

Category Number	Category Name[a]	*	Total Tasks
41642000	Sex drives		1
41660000	Development and growth of behavioral processes of the individual		7
41666100	Infant behavioral development		1
41666200	Childhood behavioral development		1
41690000	Psychopathology	*	15
41691000	Mental retardation		1
41692000	Organic brain syndrome		1
41693000	Psychoses		1
416952000	Disorders involving addictive behavior		1
41710000	Psychotherapy and counseling	*	7
41720000	Organic therapy		1
41884000	Social service administration and policy	*	18
41884100	Social services for the poor or indigent, administration and policy		7
41884200	Health services administration and policy	*	13
41884300	Educational and training services administration and policy		6
41884400	Employment services administration and policy		7
41884500	Legal services administration and policy		8
41884600	Child care services administration and policy		7

Table A.7. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FOUR (continued)

p. 7 of 7

Category Number	Category Name[a]	*	Total Tasks
41884700	Recreational services administration and policy		6
41884800	Special services for the aged or infirm administration and policy		8
41884900	Consumer protection services administration and policy		8
41885100	Social agencies (public and private) administration and policy	*	9
43700000	Consumer economics		2
65620000	Mechanics of writing English	*	25
72000000	Cuisine (cooking and baking)		2

Total: 14 skills and 114 Knowledge Categories

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[a] See Tables A.2 and A.3 for fuller descriptions

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES
REQUIRED FOR TASKS OF FACTOR FIVE
(Physical care and treatment specialty: 90 tasks)
p. 1 of 7

Category Number	Category Name[a]	*	Total Tasks
1	Locomotion		3
2	Object Manipulation	*	89
3	Guiding or Steering		6
4	Human Interaction		90
5	Leadership		27
6	Oral Use of a Relevant Language		90
7	Reading Use of a Relevant Language		81
8	Written Use of a Relevant Language		67
9	Decision Making on Methods		88
10	Decision Making on Quality		90
11	Figural Skills	*	48
12	Symbolic Skills		14
13	Taxonomic Skills		14
14	Implicative Skills		44
15	Financial Consequences of Error		76
16	Consequences of Error To Humans	*	90
11731000	Normal structure and function		23
11731100	Regional anatomy	*	50
11731200	Topographic anatomy	*	33
11731300	Hematopoietic system		2

[a] See Tables A.2and A.3for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)

p. 2 of 7

Category Number	Category Name[a]	*	Total Tasks
11731400	Circulatory system	*	26
11731500	Respiratory system	*	19
11731600	Digestive system		5
11731610	Mouth, pharynx (digestive function), esophagus		4
11731620	Stomach and small intestine		1
11731630	Large intestine (colon) and rectum		2
11731700	Urinary system and external genitalia		10
11731810	Muscles		13
11731820	Bones and joints		10
11731831	Skin and sweat glands		17
11731832	Hair		1
11731833	Nails		1
11731900	Nervous system		11
11731910	Central nervous system (brain and spinal cord)		2
11731920	Peripheral nervous system		2
11731930	Autonomic nervous system		3
11731941	Olfactory nerve and receptors		1
11731943	Eye and optic nerve		6
11731945	The ear (excluding balance function)		5
11732100	Immunologic system		2
11732210	Endocrine glands and their hormone physiology		2
11732220	Reproduction		1

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)
p. 3 of 7

Category Number	Category Name[a]	Total * Tasks
11732221	Conception and contraception	1
11732222	Male reproductive system	2
11732223	Female reproductive system	7
11732300	Homeostasis of fluids	7
11732400	Metabolism	5
11733000	Pathology	22
11733100	Infective and parasitic diseases	14
11733200	Neoplasms (cancerous growths)	3
11733300	Endocrine, nutritional, and metabolic disorders	3
11733400	Disorders of blood and blood-forming organs	2
11733510	Disorders of the central nervous system	6
11733520	Disorders of the peripheral nervous system	3
11733530	Disorders of the autonomic nervous system	2
11733545	Disorders of the ear	1
11733600	Disorders of the circulatory system	14
11733700	Disorders of the digestive system	4
11733800	Disorders of the respiratory system	11
11733900	Disorders of the uro-genital system	7
11734100	Disorders of the skin and subcutaneous tissues	16
11734200	Disorders of the musculoskeletal system and connective tissues	5

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)

p. 4 of 7

Category Number	Category Name[a]	*	Total Tasks
11734300	Congenital abnormalities		1
11734400	Disorders and complications of pregnancy, childbirth, puerperium		4
11734500	Perinatal morbidity and mortality		2
11734600	Burns		10
11734700	Poisoning		3
11734800	Shock and trauma		11
11735000	Surgery		3
11735100	Operative procedures		3
11735400	Introductory procedures	*	35
11735500	Endoscopy		2
11735600	Suture		6
11735700	Manipulation		3
11735800	Delivery methods for childbirth		1
11736000	Anesthesiology		11
11737000	First aid and care		12
11737100	Bandages, dressings, tourniquets and splints	*	20
11737200	Hemorrhage and bleeding and their arrest	*	20
11737300	Handling and transportation of the sick or wounded	*	25
11737400	Sprains, strains, fractures and their healing		6
11737500	Foreign bodies not involving wounds		9
11737600	Resuscitation		8

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)
p. 5 of 7

Category Number	Category Name[a]	*	Total Tasks
11737700	Wounds and their healing		21
11738000	Asepsis	*	54
11739430	Sanitation		7
11741000	Epidemiology		1
11742110	Kinesiology and body mechanics		1
11742132	Corrective, preventive and compensatory adjustments		7
11742133	Special post-disease and chronic disease therapy		2
11742141	Hydrotherapy		1
11742143	Heat therapy		2
11742148	Exercise		1
11743000	Nutrition and dietetics		3
11743100	Biochemistry of nutrients		2
11743200	Physiology of nutrients		2
11743300	Nutritional qualities of foods		4
11743400	Nutritional requirements and diets		5
11745000	Growth and development		15
11745100	Embryology and prenatal period		1
11745200	Neo-natal period	*	5
11745300	Infant growth (second month through second year)	*	4
11745400	Childhood growth		4
11800000	Microbiology		1

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)
p. 6 of 7

Category Number	Category Name[a]	Total * Tasks
12200000	Radiology	1
12220000	Radiographic (X-ray) analysis	3
12300000	Pharmacology	15
12313000	Drug dose-response relationships	3
12321000	Drug absorption	2
12331000	Drug toxicity	11
12332000	Drug idiosyncrasy and allergy pharmacogenetics	11
12333000	Drug resistance (of a non-genetic nature)	1
12334000	Drug tolerance and physical dependence	3
12335000	Drug synergism	3
12341100	Antibacterial and antifungal chemotherapy	9
12341200	Antiprotozoal/antimetazoal chemotherapy	4
12341400	Local chemotherapy	1
12342100	Drugs acting on the cardiovascular system and smooth muscle	6
12342200	Drugs acting on the blood and immunologic system	5
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs	5
12342400	Vitamins and nutritional agents	2
12342600	Drugs for allergy, cough, vomiting and the dermato-mucosal surfaces	5
12342700	Drugs acting on the gastrointestinal tract	4

Table A.8. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR FIVE (continued)

p. 7 of 7

Category Number	Category Name[a]	* Total Tasks
12342800	Drugs acting on the nervous system	5
12342810	Drugs acting on the autonomic nervous system	3
12342820	Drugs acting on the neuromuscular system	5
12342830	Drugs acting on the central nervous system	4
14111000	Solutions	1
15212100	Electric circuit theory	1
24130000	Electronics	1
41690000	Psychopathology	1
41884200	Health services administration and policy	1
65620000	Mechanics of writing English	22
72000000	Cuisine (cooking and baking)	1

Total: 16 skills and 118 Knowledge Categories

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[a] See Tables A.2and A.3for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.9.

SKILLS AND KNOWLEDGE CATEGORIES
REQUIRED FOR TASKS OF FACTOR SIX
(Specialty in Female Care: 27 Tasks)
p. 1 of 7

Category Number	Category Name (abbreviated)[a]	*	Total Tasks
2	Object Manipulation		25
4	Human Interaction		24
5	Leadership		14
6	Oral Use of a Relevant Language		24
7	Reading Use of a Relevant Language		26
8	Written Use of a Relevant Language		23
9	Decision Making on Methods		27
10	Decision Making on Quality		27
11	Figural Skills		20
12	Symbolic Skills		11
13	Taxonomic Skills		14
14	Implicative Skills		26
15	Financial Consequences of Error		22
16	Consequences of Error To Humans		26
11200000	Genetics	*	3
11731000	Normal structure and function		16
11731100	Regional anatomy		21
11731200	Topographic anatomy		13
11731300	Hematopoietic system		2
11731400	Circulatory system		11

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[a] See Tables A.2and A.3for fuller descriptions.

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)
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Category Number	Category Name (abbreviated)[a]	*	Total Tasks
11731500	Respiratory system		10
11731600	Digestive system		8
11731610	Mouth, pharynx (digestive function), esophagus		1
11731620	Stomach and small intestine		2
11731630	Large intestine (colon) and rectum		2
11731640	Liver, biliary system, and pancreas		1
11731700	Urinary system and external genitalia	*	19
11731810	Muscles		6
11731820	Bones and joints		3
11731831	Skin and sweat glands		9
11731900	Nervous system		7
11731910	Central nervous system (brain and spinal cord)		3
11731920	Peripheral nervous system		3
11731930	Autonomic nervous system		3
11731943	Eye and optic nerve		2
11731945	The ear (excluding balance function)		2
11732100	Immunologic system		3
11732210	Endocrine glands and their hormone physiology	*	8
11732220	Reproduction	*	14
11732221	Conception and contraception	*	12
11732222	Male reproductive system	*	11
11732223	Female reproductive system	*	21

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)
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Category Number	Category Name (abbreviated)[a]	*	Total Tasks
11732300	Homeostasis of fluids		3
11732400	Metabolism		5
11733000	Pathology		14
11733100	Infective and parasitic diseases	*	15
11733200	Neoplasms (cancerous growths)		10
11733300	Endocrine, nutritional, and metabolic disorders	*	8
11733400	Disorders of blood and blood-forming organs		2
11733510	Disorders of the central nervous system		5
11733520	Disorders of the peripheral nervous system		5
11733530	Disorders of the autonomic nervous system		4
11733543	Disorders of the eye and optic nerve		2
11733545	Disorders of the ear		2
11733600	Disorders of the circulatory system		10
11733700	Disorders of the digestive system		7
11733800	Disorders of the respiratory system		8
11733900	Disorders of the uro-genital system	*	22
11734100	Disorders of the skin and subcutaneous tissues		8
11734200	Disorders of the musculoskeletal system and connective tissues		4
11734300	Congenital abnormalities	*	5
11734400	Disorders and complications of pregnancy, childbirth, puerperium	*	9
11734500	Perinatal morbidity and mortality	*	6

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)

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Category Number	Category Name (abbreviated)[a]	*	Total Tasks
11734800	Shock and trauma		4
11735000	Surgery		5
11735100	Operative procedures	*	8
11735300	Repair surgery		2
11735400	Introductory procedures		10
11735500	Endoscopy		1
11735600	Suture		3
11735700	Manipulation		1
11735800	Delivery methods for childbirth	*	7
11736000	Anesthesiology		5
11737000	First aid and care		5
11737100	Bandages, dressings, tourniquets and splints		4
11737200	Hemorrhage and bleeding and their arrest		7
11737300	Handling and transportation of the sick or wounded		4
11737600	Resuscitation		1
11737700	Wounds and their healing		12
11738000	Asepsis		15
11739000	Community health and preventive medicine		2
11739100	Treatment of social causes of illness		1
11739430	Sanitation		1
11741000	Epidemiology	*	8
11742132	Corrective, preventive and compensatory adjustments		1

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)
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Category Number	Category Name (abbreviated)[a]	*	Total Tasks
11742148	Exercise		3
11743000	Nutrition and dietetics		7
11743100	Biochemistry of nutrients		1
11743200	Physiology of nutrients		1
11743300	Nutritional qualities of foods		3
11743400	Nutritional requirements and diets		7
11744100	Oral hygiene and care		1
11745000	Growth and development		14
11745100	Embryology and prenatal period	*	9
11745200	Neo-natal period		5
11745300	Infant growth (second month through second year)		1
11745500	Adolescent growth		3
11745600	Adulthood		3
11745700	Old age (geriatrics)		1
11800000	Microbiology	*	9
12100000	Cell biology		1
12110000	Cell morphology		1
12200000	Radiology		3
12210000	Radiobiology		1
12220000	Radiographic (X-ray) analysis		2
12300000	Pharmacology		9
12313000	Drug dose-response relationships		2

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)

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Category Number	Category Name (abbreviated)[a]	Total * Tasks
12321000	Drug absorption	2
12322000	Drug distribution	2
12323000	Drug excretion	2
12331000	Drug toxicity	5
12332000	Drug idiosyncrasy and allergy pharmacogenetics	7
12333000	Drug resistance (of a non-genetic nature)	2
12334000	Drug tolerance and physical dependence	5
12335000	Drug synergism	2
12336000	Chemical teratogenesis	2
12341100	Antibacterial and antifungal chemotherapy	6
12341200	Antiprotozoal/antimetazoal chemotherapy	3
12342100	Drugs acting on the cardiovascular system and smooth muscle	2
12342200	Drugs acting on the blood and immunologic system	2
12342300	Hormones and drugs acting on endocrine glands and accessory reproductive organs	7
12342400	Vitamins and nutritional agents	3
12342600	Drugs for allergy, cough, vomiting and the dermato-mucosal surfaces	3
12342700	Drugs acting on the gastrointestinal tract	3
12342800	Drugs acting on the nervous system	4
13900000	Biochemical processes and mechanisms	2
14111000	Solutions	1

Table A.9. SKILLS AND KNOWLEDGE CATEGORIES REQUIRED FOR TASKS OF FACTOR SIX (continued)

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Category Number	Category Name (abbreviated)[a]	*	Total Tasks
14128000	Separation methods in analysis		2
41642000	Sex drives		2
41650000	Emotions		1
41660000	Development and growth of behavioral processes of the individual		2
41666100	Infant behavioral development		3
41690000	Psychopathology		4
41691000	Mental retardation		1
41696000	Psychosomatic disorders		1
41710000	Psychotherapy and counseling		4
41884000	Social service administration and policy		1
41884100	Social services for the poor or indigent, administration and policy		1
41884200	Health services administration and policy		4
41885100	Social agencies (public and private) administration and policy		2
65620000	Mechanics of writing English		17
Total:	14 skills and 127 Knowledge Categories		

[a] See Tables A.2 and A.3 for fuller descriptions

* Asterisk designates variable determining factor at ±.41 or higher.

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR

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Task Code No.	Job Title and Abbreviated Name of Task	Task	
		Level[a]	Factor[b]
	RADIOLOGIST		
6	Reading, assessing X-rays and making recommendations.	6	Three
8	Answering MD quesitons about radiographs.	6	Three
1	Fluoroscopy of lower intestinal tract.	5	Three
3	Fluoroscopy of upper GI tract.	5	Three
4	Fluoroscopy portion of hysterosalpyngography.	5	Three
7	Assessing performance and output of X-ray workers.	5	Three
5	Instillation portion of hysterosalpyngography.	4 4	Five or Six
2	Loading or unloading film in fluoroscopy machine.	1	U
	INTERNIST		
9	Diagnosing med.condition,deciding care for non-child pt.	6	One
10	Deciding whether to proceed with care and administer medication to non-child patient.	6	One
21	Informally instructing interns, residents in pt. care.	6	One
27	Lectures to staff,students on health,medical subjects.	6	Two
25	Participating in Family Health Team conf.as internist.	6	Four
22	Responding to cardiac arrest call, providing care.	6	Five
37	Treatment of injuries.	6	Five
28	Emergency life support care.	5 6	One or Five
29	Informally instructing subordinates in patient care.	5	Two
20	Reading and interpreting "stat" X-rays on request.	5	Three
30	Spinal tap from adult patient.	5	Five
31	Bone marrow specimen from adult patient.	5	Five
32	Suturing lacerations.	5	Five
24	Assessing urgency of follow up for no-show patients.	4	Two
12	Removing a wart from non-child patient.	4	Five
13	Setting up and teaching IV apparatus for non-child pt.	4	Five
17	Determining if suspect EKG reading is true or artifact.	4	Five
19	Determining allergy to dye for IVP X-rays.	4	Five
33	Removing sutures.	4	Five

[a] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 2 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task Level[a]	Task Factor[b]
	INTERNIST (continued)		
34	Incising and draining abcess or boil.	4	Five
11	Performing routine pelvic exam on adult female pt.	4	Six
[illegible]	Filling in forms and letters describing patient's medical condition for institutions.	3a	Four
26	Participating in committees at institution.	3a	Four
18	Drawing blood from non-child patient's vein.	3	Five
38	Removing foreign object from eye and/or ear.	3	Five
15	Determining presence of trichomonas on slide.	3	Six
16	Examining a slide for gonococci.	3	Six
14	Evaluating a skin specimen slide for fungi.	3	U
35	Examining spun-down urine sediment and supernate.	3	U
36	Examining blood slide.	3	U
	OBSTETRICIAN-GYNECOLOGIST		
44	Cesarean section delivery.	7	One
47	Surgical excision of uterus, ovaries: hysterectomy through abdomen or vagina.	7	One
48	Vaginal plastic surgery or correction of vaginal hernia.	7	One
49	Ligation of fallopian tubes.	7	One
39	Diagnosing obs-gyn cond.;deciding care for female pt.	6	One
46	Saline abortion.	6	One
53	Instructing nurses in obs-gyn patient care.	6	One
43	Delivery of baby through vagina.	6 6	One or Six
27	Lectures to staff,students on health,medical subjects.	6	Two
42	Providing fertility assistance for female pt.	6 4	Six or One
40	Deciding whether to administer or change medication for female patient.	5	One
45	Currettage abortion.	5	One
41	Cauterize; cervical biopsy; polyps; IUD; retroflexed uterus: vaginal care.	5 5	Five or Six
50	Taking sample of amniotic fluid from pregnant patient.	5 5	Five or Six
54	Participating in Ob-gyn physician conference.	5	Six
24	Assessing urgency of follow up for no-show patients.	4	Two
33	Removing sutures.	4	Five
23	Filling in forms and letters describing patient's medical condition for institutions.	3a	Four
15	Determining presence of trichomonas on slide.	3	Six
51	Determine presence of monilia fungi on slide.	3	Six
52	Contributing to Family Health Team as Ob-gyn.	3	Six

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 3 of 11

		Task	
Task Code No.	Job Title and Abbreviated Name of Task	Level[a]	Factor[b]
	PEDIATRICIAN		
55	Diagnosing health and development and deciding care for pediatric patient.	6	Two
56	Deciding whether to go ahead with pediatric care and administer medication.	6	Two
63	Lectures, tests for Nurse Practitioners; delegation of duties considered.	6	Two
64	Informally training Nurse Practioners; delegation of duties considered.	6	Two
37	Treatment of injuries.	6	Five
60	Spinal tap from pediatric patient.	6	Five
62	Bone marrow sample from pediatric patient.	6	Five
28	Emergency life support care.	6 5	Five or One
29	Informally instructing subordinates in patient care.	5	Two
32	Suturing lacerations.	5	Five
20	Reading and interpreting "stat" X-rays on request.	5	Three
61	Drawing blood from pediatric patient's vein.	5	Five
24	Assessing urgency of follow up for no-show patients.	4	Two
17	Determining if suspect EKG reading is true or artifact.	4	Five
33	Removing sutures.	4	Five
34	Incising and draining abcess or boil.	4	Five
59	Removing large blunt object from pharynx.	4	Five
23	Filling in forms and letters describing patient's medical condition for institutuions.	3a	Four
26	Participating in committees at institution.	3a	Four
57	Removing foreign object from patient's ear.	3	Five
58	Preparing patient with foreign body in eye by applying dye strip.	3	Five
15	Determining presence of trichomonas on slide.	3	Six
16	Examining a slide for gonococci.	3	Six
14	Evaluating a skin specimen slide for fungi.	3	U
35	Examining spun-down urine sediment and supernate.	3	U
36	Examining blood slide.	3	U
	NURSE PRACTITIONER		
120	Preparing, presenting classes for Family Health Workers; evaluating students.	5	Two
123	Instructing Family Health Workers or Nurse-interns in patient care.	5	Two
87	Evaluating or following routine prescribed treatment or care.	5	Five

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 4 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task	
		Level[a]	Factor[b]
	NURSE PRACTITIONER (continued)		
91	Administering first aid in emergency.	5	Five
85	Providing post partum exam; evaluating condition.	5	Six
86	Prenatal exam of pregnant pt.;reporting abnormalities.	5	Six
89	Assessing condition of neonate and follow-up.	5	Six
83	Identifying obvious medical condition of adult and follow-up on care.	4	Two
88	Identifying juvenile's health condition.	4	Two
90	Post-hospital visit to chronic schizophrenic pt.	4	Four
101	Counseling in sex, contraception, VD, abortion.	4 4	Four or Six
102	Chronic or special care procedures for daily living reinforced or explained to patient.	4	Four
110	Answering patient's questions on care at RN level.	4	Four
114	Pragmatic counseling for patient on personal problems.	4	Four
115	Deciding on and arranging referral of pt. to agency.	4	Four
121	Participating in Family Health Team conference as Nurse Practitioner.	4	Four
125	RN committee work on health procedures.	4	Four
105	Irrigating,dressing,bandaging wound,burn as appropriate.	4	Five
84	Performing pelvic exam on adult female including specimens and follow-up.	4	Six
127	Work schedules planned and approved re patients.	3a	Four
100	Giving Denver Development Test for child.	3b	Four
111	Safety inspection of patient's home.	3b	Four
122	Coordinating multi-agency examinations for patient.	3b	Four
18	Drawing blood from non-child patient's vein.	3	Five
92	Removing thread stitches if appropriate.	3	Five
104	Administering common range of motion exercise on orders.	3	Five
109	Teaching irrigation, change, care of colostomy.	3	Five
112	Teaching diabetic to take medication or insulin injection.	3	Five
117	Irrigating and changing indwelling catheter.	3 3	Five or Six
118	Teaching patient irrigation of catheter.	3 3	Five or Six
119	Teaching infant's formula, feeding, bathing, diapering.	3	Five
103	Measuring, fitting diaphragm for female patient.	3	Six
107	Teaching patient self exam and care of breasts.	3 1	Six or Four
99	Administering Snellin eye test.	2	Three
94	Assessing tine test results after time lapse; follow-up on results.	2	Four
124	Checking and assessing subordinates' attendance.	2	Four
93	Applying prepackaged tine test for TB.	2	Five

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 5 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task Level[a]	Task Factor[b]
	NURSE PRACTITIONER (continued)		
95	Tablet or dipstick urine test.	2	Five
96	Taking throat culture specimen; labeling.	2	Five
98	Obtaining clean catch urine specimen.	2	U
108	Teaching patient reagent or dipstick urine test.	2	U
106	Teaching patient postural drainage technique.	1	Four
113	Giving general reassurance to any patient.	1	Four
116	Deciding whether to provide patient with transportation.	1	Four
126	Approving or changing requisition forms of subordinates.	1	Four
97	Teaching or collecting specimen for pinworm test.	1	U
	X-RAY TECHNICIAN AND LEAD X-RAY TECHNICIAN		
65	Taking X-rays with vertical or table X-ray machine.	3	Three
66	Taking IVP X-rays after allergy test.	3	Three
67	Taking lower GI series X-rays and scout film.	3	Three
68	Preparing patient and barium drink for fluoroscopy and taking upper GI X-rays.	3	Three
81	Assessing quality of radiographs.	3	Three
73	Reassuring patient about X-ray procedures.	2	Three
74	Re-explaining pre X-ray home procedures to patient.	2	Three
79	Preparing barium enema.	2	Three
82	Calling repair company re X-ray equipment.	2	Three
77	Monitoring functions and work of X-ray dept.	2	Four
76	Collecting information about and ordering supplies.	2	U
71	Developing radiographs using hand developer.	1	Three
78	Preparing radiograph packet for interpretation.	1	Three
69	Using automatic developer for X-ray and spot films.	1	U
70	Preparing hand developing tank for X-ray film.	1	U
72	Loading X-ray film cassettes.	1	U
75	Translating Spanish-English conversation.	1	U
80	Preparing materials for IVP-dye allergy test.	1	U
	LPN (Emergency Room and Unit)		
171	Assessing urgency of need for MD to see emergency pt.	4	Five
202	Giving introductory information on birth control devices on orders.	4 2	Six or Four
148	Answering patients' phone questions at LPN capability.	3b	Four
154	Participating in Unit conference as LPN.	3b	Four
158	Informally evaluating and teaching subordinate Medical Assistants.	3b	Four
203	Reinforcing diet and making ethnic substitutes.	3b	Four

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 6 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task	
		Level[a]	Factor[b]
	LPN (Emergency Room and Unit, continued)		
133	Preparing, administering, explaining subcutaneous or intramuscular injection as ordered.	3	Five
143	Obtaining urine specimen from female using catheter.	3	Five
		3	Six
156	Cleaning, dressing, bandaging wounds as ordered.	3	Five
167	Preparing and administering subcutaneous or intramuscular injections on orders.	3	Five
191	Applying splint on orders.	3	Five
192	Assisting in emergency by preparing materials.	3	Five
165	Monitoring subordinates' attendance;reporting excesses.	3	U
132	Checking and caring for equipment.	2	Three
131	Assigning staff to treatment rooms.	2	Four
159	Following up on no-show pt.; arranging new appointment.	2	Four
197	Reinforcing prescribed diet and medication.	2	Four
93	Applying prepackaged tine test for TB.	2	Five
95	Tablet or dipstick urine test.	2	Five
96	Taking throat culture specimen; labeling.	2	Five
142	Administering rectal medication as ordered.	2	Five
152	Administering prepacked smallpox vaccine on orders.	2	Five
161	Weighing and measuring patient and recording.	2	Five
162	Irrigating ear with solution as ordered.	2	Five
163	Preparing materials for special procedures.	2	Five
170	Assisting patient in dressing.	2	Five
173	Preparing patient for suturing.	2	Five
177	Treating patient for ringworm on Dr.'s orders.	2	Five
179	Preparing intravenous bottle.	2	Five
185	Assisting in administration of oxygen on orders.	2	Five
187	Giving oral medication to patient.	2	Five
188	Applying cold towels or ice bath to pt. for fever on orders.	2	Five
189	Treating patient for lice on orders by shampooing.	2	Five
190	Assisting patient to or from wheelchair.	2	Five
194	Administering eye or ear drops on orders.	2	Five
195	Applying eye patch on orders.	2	Five
198	Administering oral medication and explaining effects on Dr.'s orders.	2	Five
199	Preparing pt.,taking vital signs before Dr.'s exam.	2	Five
200	Applying hot or cold compress on Dr.'s orders.	2	Five
201	Giving cold water or alcohol rub on Dr.'s orders.	2	Five
98	Obtaining clean catch urine specimen.	2	U
128	Deciding order for non-medicinal supplies.	2	U
129	Deciding order for non-narcotic supplies.	2	U
139	Assessing results of tine test.	2	U

Table A.10 TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 7 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task	
		Level[a]	Factor[b]
	LPN (Emergency Room and Unit, continued)		
140	Teaching how to do urine test using tablet.	2	U
141	Testing stool specimen for blood using tablet.	2	U
134	Tallying information on services provided.	2	U
157	Checking chart for entry of lab results.	2	U
172	Taking stool specimen and testing for blood.	2	U
186	Explaining work area to new worker.	2	U
113	Giving general reassurance to any patient.	1	Four
138	Noticing and reporting relevant patient symptoms to Dr.	1	Four
204	Providing orientation tour of facilities and procedures at Center.	1	Four
153	Assisting Dr. in medical exam with materials.	1	Five
166	Assembling suture materials as ordered.	1	Five
180	Preparing tray for drawing blood; writing labels.	1	Five
181	Preparing tray for nasal packing.	1	Five
182	Preparing patient for gastric lavage and assisting.	1	Five
183	Inducing vomiting in patient on Dr.'s orders with medication.	1	Five
193	Preparing for bone marrow puncture on orders.	1	Five
75	Translating Spanish-English conversation.	1	U
130	Obtaining pharmaceuticals as ordered and storing.	1	U
135	Readying treatment room by wiping up and cleaning.	1	U
136	Checking and storing delivered supplies.	1	U
137	Delivering cultures and specimens to incubator or lab.	1	U
144	Preparing hot water sterilizer for use.	1	U
145	Preparing equipment for autoclave by washing,wrapping.	1	U
146	Setting autoclave.	1	U
147	Preparing patient for pelvic exam; preparing slides.	1	U
149	Sterilizing equipment in hot water sterilizer.	1	U
150	Checking medications for expiration dates.	1	U
151	Preparing treatment room by cleaning up and stocking supplies.	1	U
155	Obtaining urine specimen; preparing for lab.	1	U
168	Taking throat cultures to Dr. from incubator for assessment.	1	U
169	Collecting Dr.'s assessments of throat cultures.	1	U
160	Escorting patient within institution.	1	U
164	Filling out forms with ID information.	1	U
174	Washing and placing equipment in sterilizer.	1	U
175	Preparing equipment for autoclave by wrapping.	1	U
176	Removing sterilized equipment from autoclave;storing.	1	U
178	Wrapping sterile equipment removed from sterilizer.	1	U
184	Locking-unlocking narcotic supplies.	1	U
196	Giving patient enema kit and instructions for use.	1	U

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 8 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task Level[a]	Task Factor[b]
	FAMILY HEALTH WORKER		
91	Administering first aid in emergency.	5	Five
115	Deciding on and arranging referral of pt. to agency.	4	Four
248	Conducting routine prenatal exam.	4	Six
226	Giving basic sex education, contraception and abortion information.	4 3b	Six or Four
250	Conducting routine neonate examination.	4 4	Five or Six
236	Discussing personal, social health problems with pt.	3a	Four
239	Participating in Family Health Team conference as Family Health Worker.	3a	Four
203	Reinforcing diet and making ethnic substitutes.	3b	Four
219	Accompanying patient to any social agency.	3b	Four
237	Discussing consumer protection and helping patient with budgeting.	3b	Four
241	Providing job orientation to new co-worker Family Health Worker.	3b	Four
245	Orienting and taking intake information from new family.	3b	Four
249	Conducting routine post partum exam.	3b 3	Four or Six
252	Conducting routine exam of chronic disease pt.	3b	Four
218	Bandaging or changing bandage for minor wound as ordered.	3	Five
232	Helping any patient needing assistance in walking.	3	Five
243	Taking and recording vital signs; notifying MD of abnormalities.	3	Five
251	Conducting routine exam of any patient over six months.	3	Five
221	Making oral presentation on good health practices to community people.	2	Four
228	Teaching TB patient and family proper health practices.	2	Four
238	Deciding patient needs homemaking services and doing.	2	Four
240	Deciding and arranging appointment for pt. at Center.	2	Four
246	Reviewing intake information on family; assessing priority of problems.	2	Four
93	Applying prepackaged tine test for TB.	2	Five
95	Tablet or dipstick urine test.	2	Five
96	Taking throat culture specimen; labeling.	2	Five
190	Assisting patient to or from wheelchair.	2	Five
200	Applying hot or cold compress on Dr.'s orders.	2	Five
209	Giving alcohol bath for fever; reporting if no effect.	2	Five
210	Bathing any adult bedridden patient.	2	Five
205	Giving patient enema on doctor's orders.	2	Five
206	Examining, treating bedridden pt. for bed sores.	2	Five

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
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Task Code No.	Job Title and Abbreviated Name of Task	Task	
		Level[a]	Factor[b]
	FAMILY HEALTH WORKER (continued)		
212	Assisting any non-infant pt. to bathe or shower.	2	Five
215	Teaching how to prepare infant formula.	2 1	Five or Four
224	Deciding to make an occupied bed and making.	2	Five
229	Changing colostomy bag, irrigating on orders.	2	Five
233	Teaching pt. how to irrigate eye with water.	2	Five
244	Teaching temperature taking and care of thermometer.	2	Five
139	Assessing results of tine test.	2	U
207	Testing plaster in home for lead and reporting positive finding.	2	U
242	Discussing job description accuracy.	2	U
253	Following up on pt. discharged from hospital.	2	Four
113	Giving general reassurance to any patient.	1	Four
116	Deciding whether to provide pt. with transportation.	1	Four
204	Providing orientation tour of facilities and procedures at Center.	1	Four
208	Collecting stool specimen and taking to lab.	1	Four
211	Teaching how to bathe and diaper infant.	1	Four
216	Teaching bottle feeding and burping to new mother.	1	Four
225	Checking pt.'s medicines and having old ones discarded.	1	Four
234	Delivering medicine to patient and explaining how to take as ordered.	1 1	Four Four
247	Deciding whether family that moved stays with Family Health Team.	1	Four
254	Planning a weekly work schedule for approval.	1	Four
213	Treating baby for cradle cap.	1	Five
214	Shampooing patient with itchy scalp.	1	Five
217	Preparing food, feeding non-infant patient.	1	Five
75	Translating Spanish-English conversation.	1	U
97	Teaching or collecting specimen for pinworm test.	1	U
220	Calling person to phone or writing message.	1	U
222	Duplicating forms on duplicating machine.	1	U
223	Deciding to make an empty bed and making.	1	U
230	Preparing materials for use in a catheter irrigation.	1	U
231	Delivering and/or picking up forms and supplies.	1	U
235	Judging what supplies are needed and requesting.	1	U
	MEDICAL ASSISTANT (Unit)		
218	Bandaging or changing bandage for minor wound as ordered.	3	Five
258	Reinforcing patient in use of contraceptive.	3 2	Six or Four
257	Giving vision screening tests (Keystone and Snellin).	2	Three

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 10 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task Level[a]	Task Factor[b]
	MEDICAL ASSISTANT (Unit, continued)		
255	Contributing opinion at Unit conference as Medical Asst.	2	Four
261	Answering telephone in Unit and taking message.	2	Four
93	Applying prepackaged tine test for TB.	2	Five
95	Tablet or dipstick urine test.	2	Five
96	Taking throat culture specimen; labeling.	2	Five
161	Weighing and measuring patient and recording.	2	Five
162	Irrigating ear with solution as ordered.	2	Five
199	Preparing pt. and taking vital signs before Dr.'s exam.	2	Five
201	Giving cold water or alcohol rub on Dr.'s orders.	2	Five
256	Administering prepacked polio vaccine on orders.	2	Five
98	Obtaining clean catch urine specimen.	2	U
139	Assessing results of tine test.	2	U
140	Teaching how to do urine test using tablet.	2	U
141	Testing stool specimen for blood using tablet.	2	U
157	Checking chart for entry of lab results.	2	U
113	Giving general reassurance to any patient.	1	Four
138	Noticing and reporting relevant pt. symptoms to Dr.	1	Four
259	Taking partial history from patient.	1	Four
153	Assisting Dr. in medical exam with materials.	1	Five
260	Preparing hypodermic on orders.	1	Five
75	Translating Spanish-English conversation.	1	U
135	Readying treatment room by wiping up and cleaning.	1	U
137	Delivering cultures and specimens to incubator or lab.	1	U
145	Preparing equipment for autoclave by washing,wrapping.	1	U
146	Setting autoclave.	1	U
147	Preparing patient for pelvic exam; preparing slides.	1	U
149	Sterilizing equipment in hot water sterilizer.	1	U
151	Preparing treatment room by cleaning up and stocking supplies.	1	U
155	Obtaining urine specimen; preparing for lab.	1	U
160	Escorting patient within institution.	1	U
164	Filling out forms with ID information.	1	U
	MEDICAL ASSISTANT: EKG TECHNICIAN		
262	Preparing patient and taking electrocardiogram.	2	Three
270	Demonstrating and instructing on taking EKG.	2	Three
271	Deciding if EKG reading looks suspicious.	2	Three
128	Deciding order for non-medicinal supplies.	2	U
231	Delivering and/or picking up forms and supplies.	2	U
263	Cutting and mounting an EKG strip.	1	Three
264	Ordering duplicate copies of forms.	1	U
265	Filing or pulling records of patient.	1	U

Table A.10. TASKS BY TITLE, LEVEL AND FACTOR (continued)
p. 11 of 11

Task Code No.	Job Title and Abbreviated Name of Task	Task Level[a]	Task Factor[b]
	MEDICAL ASSISTANT: EKG TECHNICIAN (continued)		
266	Placing and arranging non-drug supplies.	1	U
267	Routine cleaning and dusting of machines.	1	U
268	Checking EKG paper and putting in new roll.	1	U
269	Deciding whether repair is needed for EKG machine.	1	U
	DARK ROOM AIDE		
71	Developing radiographs using hand developer.	1	Three
272	Checking level of developer and fixer solution.	1	Three
69	Using automatic developer for X-ray and spot films.	1	U
70	Preparing hand developing tank for X-ray film.	1	U
72	Loading X-ray film cassettes.	1	U
235	Judging what supplies are needed and requesting.	1	U
267	Routine cleaning and dusting of machines.	1	U
269	Deciding whether repair is needed for EKG machine.	1	U
273	Turning on X-ray film developing machine.	1	U

[a] Levels are as follows: 7 = Surgery; 6 = Professional II; 5 = Professional I; 4 = Semi-professional; 3 = Technician; 2 = Assistant; 1 = Aide.

[b] Factors are as follows: One = Surgery, Diagnosis, Prescription; Two = Pediatric Diagnosis and Prescription; Three = Machine Related Care and Radiology; Four = Social Service and Counseling; Five = Physical Care and Treatment; Six = Female Care; U = Unassigned to a factor.

APPENDIX B

TASK CONTENT INSTRUMENT, CURRICULUM SIGNIFICANCE RATING INSTRUMENT (Cover Sheet), AND TASK FREQUENCY SCALE

B.1 Task Content Instrument B-1

B.2 Curriculum Significance Rating Instrument Cover Sheet B-27

B.3 Task Frequency Scale B-28

B.1 TASK CONTENT INSTRUMENT

GENERAL INSTRUCTIONS

You are being asked to participate in a study of curriculum content for specific occupations. You have been asked to represent the curriculum content in the following program (or part of a program):

____

____

Respondent's name ____________________ Title ____________________

On the following pages are brief descriptions of tasks found in a variety of occupations. Please read each task description and consider it in relation to the program (or part of a program) you represent, as listed above.

Your curriculum may include any or all of the procedural instruction in the specific steps of the task, or in the subject matter which must be applied in the performance of the task, or it may be unrelated. In considering your curriculum, please assume that the content offered is successfully mastered. Do not be concerned with elementary instruction in reading or writing, if recording or reading written orders are involved in a task.

For each task, please choose from the items listed below the one which best describes the relationship between the curriculum you represent and the content of the task. Then check off its letter in the space provided below each task description. (This page should be used as your reference for what each lettered item refers to.)

There is an item with which to indicate that you need to know more about the task in order to answer, and an item with which to indicate that you do not know whether the task's content is accounted for in the curriculum you represent. Please use these options only when necessary.

CHOOSE ONE ITEM FOR EACH TASK

a. Curriculum covers all or most of the specific procedures of the task or all or most of the subject matter applied in the performance of the task.

b. Curriculum covers a significant amount of the procedures of the task or a significant amount of the subject matter applied in the performance of the task.

c. Curriculum covers a small amount of the procedures of the task or a small amount of the subject matter applied in the performance of the task.

d. Curriculum has no relationship to or bearing on the task.

e. The content of the task must have been mastered before the student is permitted to enroll in the curriculum program.

f. I do not know the relationship between the program and the task.

g. I need more information about the task.

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 55

Diagnosing a pediatric pt.'s development, psychological and medical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, tests and X-rays, examining physically, discussing symptoms; deciding on referrals, tests, X-rays, or care; prescribing care, treatment, medications, follow-up; delegating as decided; discussing with pt. and/or adult; counseling; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 39

Diagnosing any female patient's gynecological or obstetrical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, results of tests, EKG, X-rays; examining physically; taking smears or cultures; discussing symptoms; deciding on referrals, tests, X-rays, treatment, care, or procedures; and/or delegating and ordering care; treatment, medications, prescriptions, follow-up; discussing with patient; counseling on self-care; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 223

Deciding to make an unoccupied bed and obtaining clean linen, stripping empty bed of soiled linen, making up bed with clean linen; disposing of the soiled linen.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 192

Assisting in a cardiac or other emergency by bringing in emergency cart; on Dr.'s orders, preparing pt. for EKG; applying leads; and/or on Dr.'s orders preparing injections, IV bottle, or helping as ordered; afterwards having emergency cart re-equipped and returning cart.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 183

Inducing vomiting in any patient on Dr.'s orders by administering a vomit-inducing liquid.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 190

Assisting any disabled patient in moving to and from objects such as wheelchair, bed, toilet by using arms and hands to provide support; transporting to designated locations if appropriate.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 166 Assembling suture materials ordered by Dr. including suture set, suture material, needle and medication asked for by Dr. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 210, 212 Bathing or assisting in bathing of pt. with soap and water (or Pnisohex); drying, applying powder and/or lotion. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 217 Preparing food for and/or feeding any patient except an infant. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 197 Reinforcing orders prescribed by MD on diet, prohibited food, procedures for taking medication, home care, or return visits by going over with pt. and/or explaining. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 144, 149, 174, 178 Preparing treatment or equipment materials for use by sterilizing in hot water sterilizer, by filling sterilizer with water; collecting, washing, dipping in alkaline solution; placing in sterilizer; leaving for appropriate amount of time; removing; wrapping in sterile barrier paper; storing. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No 145, 146, 175 Preparing soiled equipment for sterilization in autoclave by washing, drying, inspecting for damage or missing parts, wrapping in autoclave paper; taping; setting autoclave timer;inserting wrapped packets. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. (1/2)245, 259 Taking a partial social, family and/or medical history from any patient; or filling out census form, home evaluation form on home safety,by observing, questioning orally, asking routine, predetermined questions; recording by checking off or writing responses. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 233 Deciding whether a patient needs homemaking services and what homemaking services to provide, such as shopping, cooking, serving, feeding, cleaning, bathing. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description	
Task Code No. 9 Diagnosing any non-child patient's medical condition and deciding on a course of treatment or care, by taking medical and complaint history, reviewing all relevant medical information, results of tests and X-rays; examining physically; discussing symptoms; deciding on referrals or tests and X-rays or course of care; and/or delegating and ordering care, treatment, medications, prescriptions, follow-up; discussing with patient; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 35 Determining the presence of organisms or abnormal conditions in spun-down urine sediment and supernate by spinning urine sample in centrifuge, preparing slide and examining under a microscope; testing supernate for chemical content using tablets or dipstick; measuring specific gravity of supernate; deciding on nature of findings; recording findings and conclusions. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 132, 135 Readying a treatment room for use by throwing away used materials, wiping away blood or secretion stains with anti-bacterial solution, putting clean paper on examination table; checking for treatment room equipment in need of repair, replacement or minor servicing; doing minor servicing, and/or requisitioning repair; checking treatment room set-ups. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 233 Showing any patient except infant with irritation or foreign body in eye how to irrigate by using eye cup or cotton balls and water. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 138 During course of interaction with any patient, observing symptoms or behavior, or noting concerns mentioned by patient which should be reported to aid in patient's care or diagnosis; reporting verbally. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 205 Giving any patient an enema according to orders, observing amount and color of expelled material; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description	
Task Code No. (1/3)119, 216 Instructing a new mother who will bottle feed an infant on how to bottle feed and burp the infant, by explaining and demonstrating. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 232 Helping any patient requiring assistance in walking by providing support with arms or hands if without support devices, or reinforcing instructions already given on use of walker, cane, or crutches. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. (1/3)119, 211 Instructing a new mother in how to bathe and diaper a new infant by demonstrating and explaining use of basin for bathing baby, water at tested temperature, vaseline, powder, diapers, pins; explaining how to hold baby. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 263 Cutting and mounting an EKG strip on a self-adhesive EKG chart; filling in pt. information on front of chart. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 272 Checking level of developer and fixer solutions in designated barrels in automatic X-ray film developing machine, and refilling with developer and fixer solutions from bottles containing prepared solutions. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 260 Preparing a hypodermic needle for injection according to Dr.'s or RN's orders including preparing medication, filling syringe if not prepacked, aspirating, capping needle tip with sterile cap, placing for use. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. (1/3)119,215 Instructing a new mother in how to prepare an infant's formula, either in a standard manner or according to Dr.'s orders, by demonstrating and explaining use of formula ingredients, measuring utensils, sterilizing equipment; showing how to boil formula, sterilize bottles, cap bottles, set out filled bottles to cool. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 271 Deciding if an EKG reading looks abnormal and notifying appropriate Dr. if judged "suspicious" or abnormal. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 47

Surgically excising all or part of uterus, ovaries, ovarian ducts, cysts or growths from adult female, by examining and deciding whether to go ahead; whether to enter through addominal wall or vagina; choosing anesthetic; incising skin, fatty tissue, muscle wall; deciding how much to remove based on examination and/or biopsy; excising as decided; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest; providing and/or arranging for after care; deciding when to release pt.; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 88

Identifying any child patient's physical, psychological or social condition, with consultation of Pediatrician, by taking case history, reviewing medical information, discussing with Dr., patient, and/or accompanying adult; giving general physical examination; arranging for specimens, tests, X-rays and/or referrals to special services or Pediatrician. Deciding on treatment or care, counseling, immunization, with help of Pediatrician; and arranging for administering, or follow-up as appropriate; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 63, 120

Planning and writing lectures on subjects in patient care and medicine for health workers by deciding what to present, materials to use; writing lectures, editing; presenting lectures; participating in preparation of examinations; setting grading standards; administering and grading; evaluating students' ability to perform specific activities without direct supervision.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 67

Taking lower G.I. series radiographs by taking preliminary X-ray for judging readiness for barium enema; administering enema on radiologist's orders; taking X-rays of pt. with barium enema and/or air contrast X-rays, using table X-ray machine, barium enema, air syringe; positioning, deciding on kilovoltage, preparing pt. and materials for radiologist.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 162

On orders, irrigating any patient's ear with warm water and an ear syringe; using peroxide, and reporting returns if asked.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 161

Weighing and measuring any patient, using balance scale and ruler for adults and infant scale for infants; recording on patient's chart and on anthropometric chart for children.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. (1/2)199,243,251 Conducting a routine examination of any patient 6 months old or over by taking vital signs, (temperature, blood pressure, pulse rate respiration rate); listening to chest, examining eyes, nose and throat, recording; informing Dr. or RN of abnormalities. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 141,172 On orders, taking a fresh stool specimen from any adult patient by insertion of finger cot into rectum; testing stool specimen for blood by use of filter paper, tablet and water, comparing color results with color on chart, and recording results of comparison. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 170, (1/2)199 Preparing any patient for examination by having patient undress or assisting patient in undressing and dressing. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 236 Deciding to and discussing personal, social, or health problems with patient and/or members of family or household; and providing information on agencies or other forms of help available. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 226 Deciding, on the basis of conversation with pt., whether to give or reinforce basic sex education; whether to give general information, reinforce or refer to RN on contraception information; whether to give general information and/or refer to RN on abortion information; providing information decided on. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 202,258 On orders, providing introductory information on contraception techniques by showing devices and explaining how each is used, effectiveness, advantages and disadvantages; answering questions. Checking whether female patient with a contraceptive device prescribed understands how to use it and possible side effects, by questioning and/or reinforcing. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 188,201,209 Administering cold bath or cold towels to any patient in order to reduce fever, using ice cubes and cold water in tub for child; cold towels for adults or towels or sheet soaked in cold water and alcohol; periodically checking temperature; reporting persistant fever. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 200 Applying hot and/or cold compresses or other materials as prescribed by Dr. to indicated parts of any patient's body for prescribed periods of time or until desired effect is obtained, taking precautions not to burn skin; recording treatment and results. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 105, 156, 218

Irrigating and/or dressing and bandaging a wound or burn as appropriate or on orders, using sterile procedures, sterile water or saline solution for irrigation, antiseptic (saline solution for burn) for cleansing; leaving open or dressing as appropriate or as ordered, using prescribed medication; wrapping if appropriate using sterile gauze (or vaseline gauze for burn), tape, ace bandage and/or sling; teaching patient or other person how to care for wound.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 252

Conducting a routine examination and providing follow-up care for a patient with a chronic disease, according to Dr.'s orders on care, diet, medication and tests to be explained or taken; taking vital signs, providing special care; recording; informing Dr. or RN of change in condition.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 253

Following up on a patient discharged from a hospital by checking on his intake of medication, appointments for care, deciding whether transportation is needed; notifying Dr. of any special problem.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 262, 270

Taking an EKG (electrocardiogram) of any patient according to orders by preparing patient, using electrode pads, electrodes, baby or amputee attachments as appropriate, administering exercise if ordered, placing electrodes, operating machine, tearing off readings; writing identifying information; demonstrating use of machine when asked.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 187, 198, 256

Administering medication, including vaccines, taken orally to any patient, by filling Dr.'s orders from available supplies or pharmacy (using Dr.'s prescription); serving liquid in calibrated cup to adult or older child, dropping with dropper into infant's mouth; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 189, 214

On orders, treating any patient for lice or itchy scalp by shampooing with antibacterial shampoo and warm water, or as ordered; shaving head with razor and blade if appropriate for lice condition.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 18

Drawing blood from any non-child pt.'s vein and filling vacutainer and/or test tubes with appropriate blood samples; labeling or having labeled.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 61

Drawing blood from a pediatric pt.'s vein by deciding where to draw from and syringe and needle size; preparing child by mummifying; locating vein; drawing blood, and filling test tubes with appropriate blood samples; providing after-care for puncture to prevent hemorraging.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 81

Assessing the quality of radiographs.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 79

Preparing a barium enema by filling bag containing powder with specified amount of water, assembling tube and clamp, and placing on work table or hanging at proper height.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 51

Determining the presence of monilia (candida) fungi in a slide of vaginal secretion, by adding potassium hydroxide and examining under microscope; recording findings

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 3

Performing fluoroscopy of any pt.'s upper G.I. tract, by reassuring pt., supervising administration of barium drink; setting and using fluoroscope monitor; deciding on and taking spot films; specifying in detail any special X-rays to be taken; recording observations.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 69

Developing radiographs and spot films by use of automatic film developing machine, including unloading cassettes, transferring identification from card to film with flasher machine, mounting 70 m.m. rolls on film sheets; inserting film in developer; being sure light in room is out during entire process and until buzzer signals.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 58

Preparing any patient with foreign object in eye for care at hospital, by applying strip of sodium soluble fluorescein dye; applying eye patch; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 60 Taking a sample of spinal fluid from any pediatric pt. by ordering materials, having pt. prepared, injecting local anesthetic, inserting needle into subarachnoid space, taking pressure with monometer and recording, drawing up fluid into syringe, examining fluid and deciding if emergency care and/or hospitalization is necessary; prescribing and administering IV infusion of food and/or medication; taking and recording fluid pressure again, arranging to have lab tests done; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 30 Taking a sample of spinal fluid from any non-child pt. by ordering materials, having patient prepared, injecting local anesthetic, inserting needle into subarachnoid space, taking pressure with manometer and recording, drawing up fluid into syringe, examining fluid and deciding if emergancy hospitalization is necessary, taking and recording fluid pressure again, arranging to have lab tests done and recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 100 Administering, recording and self-scoring the Denver Developmental Screening Test for any child, by presenting objects and words for child's response, substituting appropriate ethnic items or words if appropriate; reporting gross abnormalities in development to Pediatrician; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 182 Preparing patient for gastric lavage and/or bringing and setting up suction machine for use by Dr. by rolling in, cleaning and attaching disposable catheter; turning machine on and off at Dr.'s orders; cleaning up afterwards and taking sample or material from container for Dr.'s inspection, if called for. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 173 Preparing a patient for suturing under Dr.'s orders and supervision by cleaning area with antibacterial agent, shaving hairy area using razor and antibacterial lathering agent. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 179 Preparing an intravenous bottle for use according to orders; filling bottle with prescribed medication, labeling bottle with medication, if prescribed, and time; attaching to IV pole, placing needles on tray, placing near patient for use. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description	
Task Code No. 65 Taking radiographs (X-rays) of any pt. according to Dr.'s orders, using vertical and/or table X-ray machines, including positioning patient, adjusting controls and kilovoltage; judging quality; preparing for pick-up. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. (1/2)38,57 Removing a foreign object from any pt.'s ear, by using light, head mirror and ear speculum to locate, Zephiran solution to lure live object from ear; flushing with ear syringe or using forceps with ear speculum and mirror to remove object from ear; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 15 Determining the presence of trichomonas protozoa in a prepared fresh slide of vaginal secretion, by examining under microscope while still fresh; recording findings. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 72 Loading a cassette(s) with unexposed, standard size, X-ray film(s), being sure light is out in room during process, and/or filling box for vertical X-ray machine with unexposed X-ray films. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 50 Taking a sample of amniotic fluid from a pregnant pt. by ordering materials, having pt. prepared, injecting local anesthetic, inserting amniocentesis needle through abdomen into uterus; drawing up fluid into syringe; examining fluid; filling test tubes; arranging to have lab tests done; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. (1/2)38 Removing a foreign object from any pt.'s eye, by using magnification lens and reflected light to locate, and eye anesthetic and applicator stick to remove object; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 31 Taking a bone marrow sample from a non-child patient by ordering materials, having patient prepared, injecting local anesthetic, inserting bone marrow needle and drawing up marrow into syringe; arranging to have lab tests done; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 62 Taking a bone marrow sample from a pediatric patient by ordering materials, having patient prepared, injecting local anesthetic, inserting bone marrow needle and drawing up marrow into syringe; arranging to have lab tests done; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 48

Performing vaginal plastic surgery or surgically correcting vaginal hernia in adult female, by examining and deciding whether to go ahead; choosing anesthetic; deciding what manipulation to perform and what to remove; incising vagina, examining tissues and/or having biopsy done; manipulating or excising tissues as decided; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest: providing and/or arranging for after care; deciding when to release patient; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 89

Assessing a newborn infant's medical condition for presence of abnormalities or problem, by physically examining, talking with mother, taking history; consulting with Pediatrician in cases of deformity or abnormality; treating minor problems such as umbilical stump or circumcision wound; deciding on counseling mother on infant care; arranging for referral to Pediatrician or follow-up if appropriate; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 103

Measuring and/or re-fitting any fertile, non-pregnant female patient for a diaphragm and/or teaching patient use, care and precautions involved with diaphragm and spermacidal jelly or cream; measuring with fingers or cervimeter and trying out sizes to fit; teaching through explanation, demonstration and observation; arranging for revisits; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 101

Providing counseling and instruction in sex matters, contraception, VD, and/or abortion for any adolescent or adult-age pt., by talking about problems, using literature, visual aids, models; explaining options, side effects, consequences of possible decisions; deciding whether to refer; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 97

Preparing test for pinworms either by teaching parent or adult how to prepare slide by use of scotch tape wiped around child's anus or taking specimen personally (early morning); arranging for labeled slide to be taken to lab on same day; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 171

Giving opinion on whether any patient waiting in emergency room is in need of immediate attention of Dr., based on talking with pt., looking at condition and checking chart, if available.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 71 Developing radiographs by use of hand developer, by unloading cassettes, transferring identification from card to film with flasher machine; and deciding on or checking time needed in use of tank compartments for developer, fixer solutions and water; drying. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 59 Removing a large, blunt metal object from any patient's pharynx, by inspecting with laryngoscope or interpreting X-rays and deciding whether to remove or send to hospital; removing with use of fingers or forceps, holding tongue with tongue blade. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 6, 20 Reading and interpreting radiographs and/or spot films (new and/or old) and making recommendations; reporting findings, conclusions and recommendations based on readings and notes. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 96 Taking a throat specimen from any pt.; preparing culture; labeling, having it incubated; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 11, 84 Performing a routine pelvic examination on any adult female patient; taking samples for Pap and/or other tests; recording on patient's chart and Pap smear (cytology) form; having Pap smear slides and/or other slides and/or cultures prepared for lab. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 28 Determining whether a patient requires immediate emergency medical care, deciding whether to call ambulance and what immediate life support procedures to administer; applying procedures covering loss of breathing, cardiac arrest, hemorrhaging, poisoning, drug overdose, shock, splinting serious fractures. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 95,108,140 Testing urine specimen obtained from pt. for content such as glucose, protein, blood, ketones, by use of tablet, urine and water in test tube (for sugar) or tablet and urine for acetone, or by use of dipstick; comparing color results with color on chart; recording results based on chart comparison. Teaching pt. to perform and keep record of results. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 17 Evaluating suspicious EKG readings of any patient to determine whether they are caused by a true health dysfunction or are mechanical or electrical artifacts; taking appropriate action, such as adjusting equipment, caring for pt., summoning emergency care. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 117, 118

Irrigating indwelling (Foley) catheter on any patient, using sterile materials and saline solution and flushing catheter, allowing returns to flow out into basin; inspecting returns; deciding to change or changing female's catheter on orders (if performer is female) by cleansing area with antiseptic soap solution, removing old catheter and inserting new one in urethra, attaching leg bag; arranging to have male catheter changed; instructing member(s) of household or patient in irrigation of catheter, by demonstration and explanation.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 112

Teaching a diabetic pt. and/or members of household how to take oral medication or inject insulin according to Dr.'s orders, by showing how to prepare syringe, swab area with alcohol, choose site of injection, check to be sure needle is not in blood vessel (having pt. practice on an orange), how to care for site of injection; explaining onset of coma or insulin shock and what to do for each; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 250

Conducting a routine neonate (newborn) examination by inspecting spontaneous movement of extremities, parts of the body, reflexes; caring for umbilical stump; collecting information on feeding, stool, sleep; reinforcing mother in proper infant care; recording observations; informing Dr. or RN of abnormal conditions.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No.(1/2) 257

Administering and recording a vision screening test of a patient using Keystone vision testing machine, referring if less than perfect vision.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 206

Examining any bedridden or immobilized patient for presence of bed sores; if found, giving decubital care using lotion on skin and Phisohex on open sores; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 228

Teaching a TB patient and/or members of his household proper daily health practices.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 16

Examining a slide prepared with penis or vaginal discharge by heating over flame, applying stain, using Gram's method, and examining under microscope for presence of gonococci (gonorrhea); recording findings.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 33, 92

Removing a patient's sutures using antiseptic, clamp, scissors, forceps; evaluating healing; deciding on ordering antibiotics, medication, irrigation and/or bandaging; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 80

Assembling medications and materials to be used for test of allergy to radiopaque dye used in intravenous pyelogram (IVP) and for patient care in case of adverse reaction.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 23

Describing or evaluating patient's medical condition and/or medical or social history, based on patient's chart and knowledge of patient's condition. (For use by other institutions.)

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 32

Suturing any patient's small open wound by injecting local anesthetic, deciding on number of stitches, knot, suture material, needle; sterilizing; sewing; providing shots, instructing on daily visits, and notifying Health Department if human or animal bite; explaining home care to patient or accompanying adult; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 36

Observing patient's blood sample under microscope and determining condition, by dropping and smearing blood on slide, applying appropriate stain, examining under microscope; recording findings.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 2

Deciding when to load 70 m.m. film into photographic attachment on fluoroscope machine and inserting new spool of 70 m.m film, threading into machine part, closing, and advancing film to compensate for any exposure to light; removing exposed roll and placing for developing.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 34

Incising and draining any patient's external abscess or boil, using topical anesthetic, antiseptic, lancet or scalpel; deciding on medication, packing, dressing and bandage; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 109, 229

Teaching a patient, family member or subordinate how to irrigate, change and care for colostomy, by demonstrating and explaining changing of bag, use of enema for irrigating, use of solvent and cement for attaching, or self adhesive bags; explaining care of skin; reinforcing proper health habits; providing psychological support; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 102, 111

Providing any patient with special or chronic condition with counseling, reinforcement and instruction in daily living adaptations related to his condition, by reviewing diet and medication procedures, ways to adapt home, what to do in emergency; giving emotional support; inspecting or arranging for safety inspection of home; recording safety hazards; deciding on problems and solutions; arranging for special care or services, or follow-up; reporting major problems.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 224

Deciding to make bed containing bedridden patient and obtaining clean linen, stripping bed and making bed with clean linen by rolling patient from one side to the other; disposing of soiled linen.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 225

Checking family's or patient's drugs and medications for old or left-over medication, and explaining to family the need to throw out old medications or those left over after a course of treatment is over.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 213

Treating a baby for cradle cap according to orders by washing with oil, brushing, and washing with water.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 221

Giving an oral presentation about good general health care practices to a group of community people, such as school children.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 56

Deciding on whether to carry out a prescribed course of treatment, care or medication for a pediatric patient, and/or changing or approving renewal of prescriptions, by reviewing prescribed care, examining present condition, discussing progress and symptoms with patient and/or accompanying adult; deciding to administer medication or care or to have it done by subordinate; ordering medications materials; and/or administering medications;by insertion, as drops, as injections; observing relevant reactions; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 41

Providing prescribed intra-vaginal treatment or care for any female pt., by reviewing prescription, present condition; deciding to go ahead or change procedure; cauterizing,using electric cauterizer; doing punch cervical biopsy; inserting IUD using betadine and tenaculum; removing vaginal polyps using forceps; correcting retroflexed uterus by inserting pessary; fitting diaphragm; using sterile procedure, gloves, speculum; explaining aftercare to pt. or appropriate instructions; arranging for follow-up; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 193

Preparing any patient and materials for a bone marrow puncture or spinal tap, on Dr.'s orders, by laying out appropriate prepacked kit, cleansing appropriate body part with antiseptic, draping patient with sheet if appropriate, and informing Dr. when patient is ready.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 248

Conducting a routine pre-natal examination of a pregnant pt. under supervision by making health checks, discussing physical and emotional health; providing information and instruction on health practices, childbirth, available services, abortion; recording observations; informing Dr. or RN of abnormal conditions.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 185

Assisting in administration of oxygen to any patient by wheeling in oxygen tank, placing mask on patient, turning on machine and adjusting oxygen flow under supervision, according to Dr.'s orders.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 195

Applying an eye patch for any patient on orders.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 43

Delivering a baby through the vagina, by examining pt.; judging when there is true labor; ordering IV; deciding when to send pt. to delivery room; deciding on pain relief and/or anesthetic, whether to rupture amnionic sac, whether to perform cesarean section. Assisting in birth with forceps, vacuum extractor and/or performing episiotomy with scissors; providing emergency care in case of cardiac arrest; clamping and cutting umbilical cord; inspecting placenta; providing aftercare; deciding when to release pt.; recording and filling out any necessary papers.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 83

Identifying obvious medical condition of any non-child patient and arranging for routine care or referring patient to Dr., by taking case history, interviewing patient about symptoms, taking vital signs, looking at throat; ordering standard tests, specimens, X-rays and/or medications on advice of doctor; deciding to perform or delegate some tests, specimen taking or giving medication; explaining to patient, recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 246

Selecting routine diagnostic tests and/or initial instruction or advice for pt. based on intake information; reviewing and listing problems of family; deciding on order of priority; deciding on home visits or appointments based on Dr.'s orders.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 249

Conducting routine post-partum examination of a new mother by checking vaginal stitches, breasts, vital signs, uterine fondus; asking about discharge, bleeding, health functions; providing instruction in care of stitches, breasts, how to deal with milk, breast feeding; recording observations; informing Dr. or RN of abnormal conditions.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 244

Teaching pt. and/or members of household how to take temperature using oral and/or rectal thermometer by explanation and demonstration, including demonstrating with child patient; showing how to care for and clean thermometer.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 194

Administering medication in the form of eye or ear drops to any patient, according to orders.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 87

Carrying out a prescribed course of treatment or care or arranging for refill of medication for any patient, by reviewing prescribed care, examining present condition, discussing with patient; deciding to refer problems or regulated drug renewal requests to Dr. for consultation or approval. Ordering or administering medications, providing care such as for infections or wounds; assessing progress; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 46

Performing a saline abortion on a female with 12 to 24 weeks of pregnancy, by examining and deciding whether to go ahead; deciding on anesthetic; retracting vagina; using syringe and catheter to withdraw amnionic fluid, and syringe to inject hypertonic fluid into amniotic cavity of uterus; checking patient's condition; returning after 48 hours to check patient after she has aborted; arranging after care and follow-up; recording on necessary documents.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 19

Deciding whether to administer radiopaque solution for IVP (X-ray of kidney and ureter), by questioning patient about allergy to iodine, history of asthma;and/or injecting and watching reactions to 2 cc test injection; if ok, injecting full amt. of radiopaque solution, standing by for delayed adverse effects; telling lab technician when to go ahead with IVP. If adverse effects,administering emergency care;informing pt. of allergy.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 13

Setting up an intravenous apparatus for a non-child patient by preparing bottle(s) of prescribed solution, inserting the IV needle into patient's vein, and regulating the flow.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 68

Preparing patient and barium drink for fluoroscopy; taking X-rays following fluoroscopy according to standard procedures and proper lapses of time, using table X-ray machine; positioning, deciding on kilovoltage.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 66

Taking IVP's (intravenous pyelogram(s)) according to Dr.'s orders; including preparing for allergy test and proceeding only on Dr.'s orders; positioning; adjusting controls on table X-ray machine; watching for delayed adverse reactions of patient.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 86

Performing a pre-natal examination on any pregnant female patient, by taking vital signs, height, weight, examining breasts, listening to fetal heartbeat, performing pelvic examination; counseling and discussing pregnancy, care, diet hospitalization, emotional problems; taking specimens for tests; identifying condition or consulting Dr. if abnormalities found; prescribing care, treatment or medication with Dr.'s approval if appropriate; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 1

Performing fluoroscopy of any pt.'s lower intestinal tract, by deciding if "scout film" shows clear tract, reassuring pt., supervising X-ray technician in administering barium enema, setting and using fluoroscope machine, observing lower intestines on monitor; deciding on and taking spot films, watching out for bowel puncture and arranging to hospitalize if necessary; specifying in detail any special X-rays to be taken; recording observations.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 152

On Dr.'s orders inoculating any patient with smallpox vaccine using prepackaged vaccine and monovacc needle; explaining aftercare to patient; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 147

Preparing a patient for a pelvic examination by preparing materials, including instruments and materials for slides; taking wet prep slides to lab; preparing other slides for lab, including use of fixative; labeling.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 45

Performing an abortion by applying currettage to female with twelve weeks or less of pregnancy, by examining and deciding whether to go ahead; deciding on anesthetic; retracting vagina; applying vacuum suction; scraping remaining matter, checking patient's condition; arranging for follow-up and/or after care; recording on necessary documents.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

Task Code No. 142

Administering rectal medication to any patient, according to orders, using finger cot; recording.

( ) ( ) ( ) ( ) ( ) ( ) ( )
a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 4 Performing fluoroscopy portion of hysterosalpingography on any adult female patient, by reassuring pt.; supervising the instillation of roentgenopaque (hypaque) solution into uterus and uterine tubes; setting and using fluoroscope machine; observing condition of organs on monitor; deciding on and taking spot films; specifying in detail any special X-rays to be taken; and recording observations. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 85 Providing post-partum examination and evaluating condition of a new mother by giving general examination, checking vaginal stitches, breasts, uterine fundus, asking about discharge, bleeding, health functions; providing instruction in care of stitches, breasts, how to deal with milk, breast feeding; diagnosing and prescribing care for minor problems; referring abnormalities to Dr.; arranging for treatment, care, medication; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 153,163,180,181,230 Preparing materials for special procedures by making sure materials are sterile for use and/or that kits are not expired; assisting in procedures by handing examination or treatment supplies, materials or equipment as ordered, and/or turning equipment on, off or adjusting as required, or on orders; and/or preparing trays with equipment; labeling samples taken. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 143 On orders, obtaining urine from any female patient by use of female catheter under sterile conditions, by inserting catheter, massaging patient to help void urine and, if ordered, measuring urine, delivering for inspection or preparing for laboratory analysis; recording amount obtained and/or abnormal appearance. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 22 Responding to cardiac arrest of any pt. by cooperating to take emergency action such as insertion of endotracheal tube, performing tracheostomy; administration of artificial respiration and oxygen; providing cardiac massage; taking EKG and applying defibrillator; injecting intracardiac stimulant; providing IV infusion. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 94,139 Assessing results of Tine Test (TB) after correct lapse of time by examining patient's arm and comparing raised area to given standards to determine positive or negative results; recording; informing Dr. if positive results. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description	
Task Code No. 44 Delivering a baby by cesarean section, by examining patient and deciding whether to go ahead with surgery; deciding on anesthetic, location of incisions; incising skin, fatty tissue, muscle wall, and uterine wall; retracting; removing infant, clamping off and cutting umbilical cord, removing placenta; closing, choosing suture materials, suturing; providing after care; deciding when to release pt; recording and filling out necessary papers. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 40 Deciding to administer, change (and/or approve renewal of prescription for) medication for OBS-GYN patient, by reviewing RX, chart, present condition; discussing progress and symptoms with patient; deciding to administer medication or to have it done by subordinate; ordering medications, materials; administering medication by intravenous, intramuscular or subcutaneous injection, or by inserting in vagina or rectum; observing reactions; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 207 Deciding to test and testing plaster in patient's home for lead by using prepared solution; making appointment for examination for children if results are positive; notifying Poison Control. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 237 Deciding to discuss with and advise patient and/or members of household on consumer protection and/or rights, using literature and information; and/or advising on how to stretch money using information on good practice and available aids; and/or helping to design a family budget. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 191 Applying a splint to any patient according to orders by bending to prescribed angle, using gauze, tape, ace bandage, board and/or sling; as required. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 268 Checking EKG machine for its supply of cardiograph paper and replacing roll when needed. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 5 Performing instillation portion of hysterosalpingography on any adult female pt., by reassuring patient; inserting sterile vaginal speculum;and inserting cannula, using sterile tenaculum, through cervix into uterine cavity; instilling roentgenopaque (hypaque) solution when told. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 14 Evaluating a prepared skin specimen slide for presence of mycelia (fungi) by adding KOH solution, heating over flame, and examining slide under microscope; recording findings. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 93 Testing any patient for TB by applying a prepackaged Tine test to arm, instructing patient when to return for results, recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 91 In an emergency, deciding whether to have ambulance called; deciding what first aid to provide on the spot; providing first aid. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 12 Removing a wart from a pt. by using scalpel and/or electrodesiccator - fulgurator local anesthetic; deciding whether to have specimen analyzed for pathology; if so, cutting specimen and preparing for analysis, by putting in preservative and filling out report; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 70 Preparing a tank used for hand developing of X-ray films for use by filling water compartment with water, making sure temperature is at 68° F., stirring developer and fixer solutions in their compartments; covering compartments. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 42 Providing fertility assistance to adult female pt. by deciding to do any or all procedures involving counseling, instruction in temperature charting, prescribing medication, using needle and syringe for andrometric biopsy and analysis, arranging for analysis of husband's sperm; discussing findings with patient; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 27 Planning and presenting lectures on prescribed subjects in pt. care and medicine to health workers by deciding what should be presented, planning outline and method of presentation, assembling instructional materials, and presenting lectures. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 49 Performing ligation of fallopian tubes on adult female by examining and deciding whether to go ahead, whether to enter through abdominal wall or vagina; choosing anesthetic; incising; examining for tumors and, if found, performing biopsy; excising malignant tissue; ligating each tube in two places and cutting tubes; closing, choosing suture materials, suturing; providing emergency care in case of cardiac arrest; providing and/or arranging for after care; deciding when to release patient; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 37 Caring for any patient with injury such as lacerated wound, fracture, sprain, burn or bleeding nose, by deciding on procedures and materials, using sterile procedures if appropriate, and cleaning, applying butterfly adhesive, medication, sterile dressing, splint, tape, bandage, packing, sling as appropriate; prescribing antibiotic or pain killer if appropriate; explaining care to pt. or family including care of injury, use of medication, crutches, other aids, signs of infection; arranging follow-up; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 107 Examining and teaching an adult female patient self examination of breasts, care of minor cracks and infections and danger signs; arranging follow-up attention if warranted; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 104 Administering a common range of motion exercise to any patient on orders, by grasping limb and moving to natural limits in all directions; teaching patient or member of household by demonstration; reporting major changes in pt.'s condition; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 115 Deciding on or reconfirming appropriate agencies for patient's needs; arranging for referral by writing letter, using agency forms or contacting by phone; obtaining patient permission slips or Dr.'s signatures if needed. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 99, (1/2)257 Administering and recording a vision screening test to any patient except infants using Snellin eye charts; recording; referring if serious defects are evident. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description

Task Code No. 10 Deciding on whether to carry out a prescribed course of treatment, care or medication for a non-child patient, and/or changing or approving renewal of prescriptions, by reviewing prescribed care, examining present condition, discussing progress and symptoms with patient; deciding to administer medication or care or to have it done by subordinate; ordering medications, materials and/or administering medications; observing relevant reactions; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 90 Performing a post-hospital visit with a chronic schizophrenic patient by talking with patient and checking on medication intake; evaluating whether medication should be reconsidered, whether patient should be seen by psychiatrist; providing counseling in daily living and social problems to patient and/or family; arranging for follow-up referrals, and/or readmission to hospital; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 114 Providing pragmatic counseling on personal problems to any troubled patient, by talking with patient and helping to find solutions to problems; judging if patient is seriously disturbed; and referring to psychiatrist or Dr.; arranging for follow-up referrals if appropriate; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 106 Instructing any patient (or adult caring for child) in postural drainage technique, on Dr.'s orders, by showing pt. how to lie on bed to have mucus drain reinforcing good personal health practices; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g
Task Code No. 98 Obtaining a clean catch urine specimen from any patient by explaining clean catch procedure, giving kit, applying procedures to infant, using soap, water, swabs and self adhering urine bag; labeling, preparing for lab; recording. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	Task Code No. 177 Treating any patient for ringworm according to orders by cleaning area with antibacterial agent, shaving hairy area and applying prescribed ointment. ( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.1 TASK CONTENT INSTRUMENT (continued)

Check Appropriate Letter For Each Task Description	
Task Code No. 203	Task Code No. 133,167
Explaining the nature and purpose of a special diet to any patient; helping to come up with substitutes in the ethnic foods of the patient that are compatible with diet; explaining consequences of not following, using information on the diet and the patient's condition from his chart and a general knowledge of the nutritional content of foods.	Preparing and administering a subcutaneous or intramuscular injection according to Dr.'s orders by preparing medication, filling syringe (from prepackaged or prepared medication), checking patient's allergies; advising of side effects of immunizations, choosing where to inject; disinfecting area before injecting, recording.
( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g	( ) ( ) ( ) ( ) ( ) ( ) ( ) a b c d e f g

B.2 CURRICULUM SIGNIFICANCE RATING INSTRUMENT (Cover Sheet)

GENERAL INSTRUCTIONS

Program (or part of program) ______________________________

____

Respondent's Name ____________________ Title ________________

At an earlier time you were asked to identify the relationship between the program (or part of a program) you represent, as listed above, and the content of a given set of task descriptions. Attached is a selected list of those task descriptions which you designated as being covered by your curriculum completely, to a significant extent, or to a small extent.

Please consider all the tasks presented in the attached page(s) and think of those parts of your program which relate to those tasks. Consider those parts as a section of your curriculum. Then, please check the description below which best represents your estimate of how that section of your curriculum relates to your entire program (or part of a program) as listed above.

CURRICULUM SIGNIFICANCE RATING SCALE

5..( )...The section of curriculum represented amounts to several courses or more in the program.

4..( )...The section of curriculum represented amounts to an entire course or major portions of several courses in the program.

3..( )...The section of curriculum represented amounts to a major portion of a course or minor portions of several courses in the program.

2..( )...The section of curriculum represented amounts to a minor portion of a course in the program.

1..( )...The section of curriculum represented amounts to a negligible portion of a course or several courses in the program.

B.3 TASK FREQUENCY SCALE

This scale refers to the frequency with which the task being scaled is executed by the performer. Tasks which are regularly done should be scaled with the use of the wording outside of the parentheses in the statements presented below. Tasks which are done infrequently or concentrated into certain times during the year should be rated with the use of the wording within the parentheses; these represent conversions to a normal work year.

SCALE VALUE	DESCRIPTIVE STATEMENT
0	Task is never done.
1	Task is done once per year or less.
2	Task is done more often than once per year, but less than once per month (no more than 11 times per year).
3	Task is done once per month or more, but less often then once per week (no more than 33 times per year).
4	Task is done once per week or more, but less often than once per day (no more than 180 times per year).
-	
6	Task is done once per day or more, but less often than five times per day (no more than 912 times per year).
7	Task is done five times per day or more, but less often than ten times per day (no more than 2,052 times per year).
8	Task is done ten times per day or more, but less often than fifty times per day (no more than 11,172 times per year).
9	Task is done fifty times per day or more (11,173 times per year or more).